The copy filmed here has been reproduced thanks to the generosity of:

National Library of Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol ⟶ (meaning "CONTINUED"), or the symbol ▽ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:

L'exemplaire filmé fut reproduit grâce à la générosité de:

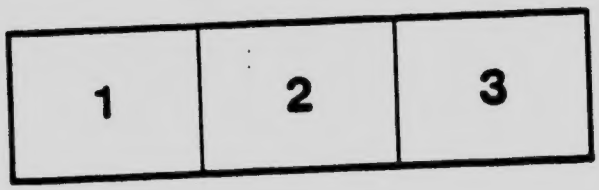
Bibliothèque nationale du Canada

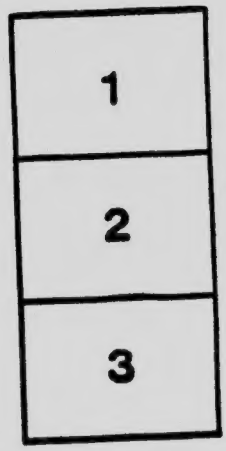
Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

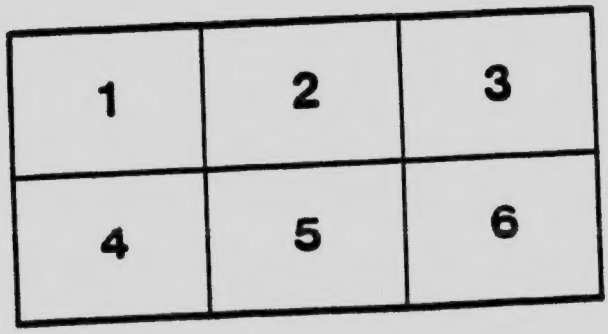
Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole ⟶ signifie "A SUIVRE", le symbole ▽ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.







CA.M.486

M 32-238 = 4

Canadian Board on Geographical Names

CANADA
DEPARTMENT OF MINES
HON. LOUIS CODERRE, MINISTER; A. P. LOW, LL.D., DEPUTY MINISTER.
MINES BRANCH
EUGENE HAANEL, PH.D., DIRECTOR.

A GENERAL SUMMARY

OF THE

MINERAL PRODUCTION

OF

CANADA

During the Calendar Year

1912

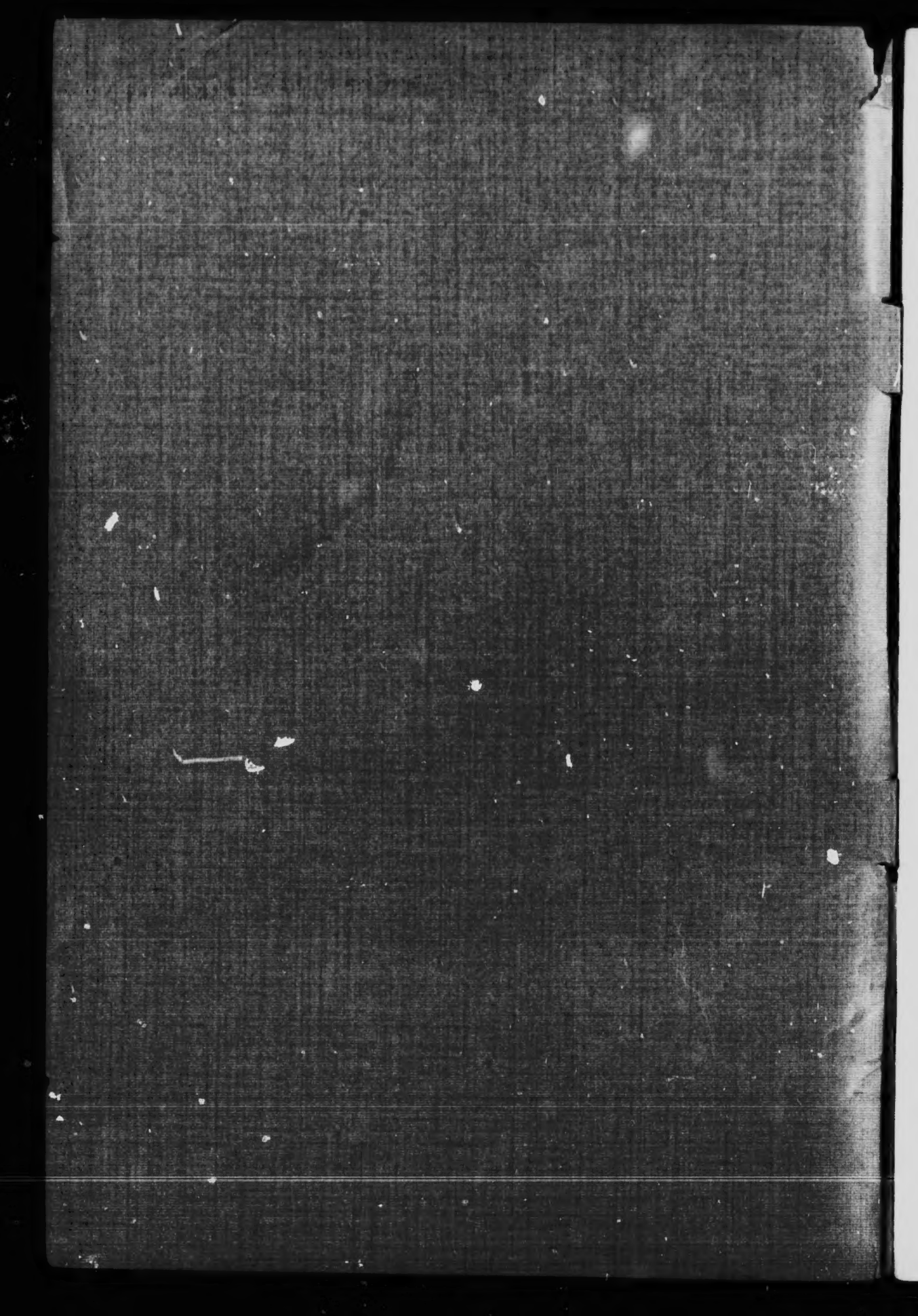
JOHN McLEISH, B.A.

Chief of the Division of Mineral Resources and Statistics.

OTTAWA
GOVERNMENT PRINTING BUREAU
1913

No. 238

PDN



CANADA
DEPARTMENT OF MINES
HON. LOUIS CODERRE, MINISTER; A. P. LOW, LL.D., DEPUTY MINISTER.
MINES BRANCH
EUGENE HAANEL, PH.D., DIRECTOR.

A GENERAL SUMMARY

OF THE

MINERAL PRODUCTION

OF

CANADA

During the Calendar Year

1912

JOHN McLEISH, B.A.

Chief of the Division of Mineral Resources and Statistics.

OTTAWA
GOVERNMENT PRINTING BUREAU
1913

45060—1

No. 238

CONTENTS.

	Page.
Mineral production of Canada in 1911 and 1912, comparative table	6
Exports and imports (general tables)	13
Metallic ores and products	18
Non-metallic products	20
Structural materials and clay products	25
Production by provinces, 191. and 1912	27
Mine production	34
Smelter production	39

THE

MINERAL PRODUCTION OF CANADA

During the Calendar Year

1912

General Summary.

Canada's progress and growth in industrial development is strongly reflected in the statistical record of her mineral production. An annual record has been published since 1886, in which year the total value of the production was a little in excess of ten million dollars, or $2.23 per capita of population. In 1912 the value of the production according to revised statistics now completed was $135,048,296, or nearly $19 per capita, the preliminary record published in March last showing a value of $13[illegible]127,489 having been exceeded by nearly two million dollars.

Comparing last year's production with that of the years immediately preceding we find an increase over the 1911 value of output of $31,827,302 or 30·8 per cent. It will be remembered, however, that the mineral output in 1911 was somewhat restricted owing to long extended labour disputes in the coal mines of Alberta and British Columbia, and was less than that of 1910, in which year the production was valued at $106,823,623 or $14.93 per capita, and the highest record up to that year. Compared with 1910 the production in 1912 still shows an increase in total value of $28,224,673 or 26·5 per cent, and an increase in per capita production from $14.93 to $18.27 or 22·3 per cent.

Annual Mineral Production in Canada since 1886.

Year.	Value of production.	Value per capita.	Year.	Value of production.	Value per capita.
	$	$ cts.		$	$ cts.
1886	10,221,255	2 23	1900	64,420,877	12 04
1887	10,321,331	2 23	1901	65,797,911	12 16
1888	12,518,894	2 67	1902	63,231,836	11 36
1889	14,013,113	2 96	1903	61,740,513	10 83
1890	16,763,353	3 50	1904	60,082,771	10 27
1891	18,976,616	3 92	1905	69,078,999	11 49
1892	16,623,415	3 39	1906	79,286,697	12 81
1893	20,035,082	4 04	1907	86,865,202	13 75
1894	19,931,158	3 98	1908	85,557,101	13 16
1895	20,505,917	4 05	1909	91,831,441	13 70
1896	22,474,256	4 38	1910	106,823,623	14 93
1897	28,485,023	5 49	1911	103,220,994	14 42
1898	38,412,431	7 32	1912	135,048,296	18 27
1899	49,234,005	9 27			

Comparative Statement of Mineral Production for Years 1911 and 1912.

Product.		1911.			1912.			Increase (+) or Decrease (−).		Increase (+) or Decrease (−).	
		Quantity.	Value. (a)	Per cent of total.	Quantity.	Value (a)	Per cent of total.	Quantity.	%	Value.	%
Metallic.			$	%		$	%			$	
Cobalt oxide and nickel oxide	Lbs.	154,174	221,690	0·22	349,054	156,256	0·24	+ 194,880	126·00	+ 98,554	44·46
Cobalt material, mixed cobalt and nickel oxides	"	1,260,832			1,285,280	163,988		+ 24,448	1·94		
Copper (b)	"	55,648,011	6,886,998	6·67	77,832,127	12,718,548	9·42	+ 22,184,116	39·87	+ 5,831,550	84·67
Gold	Ozs.	473,159	9,781,077	9·48	611,885	12,648,794	9·37	+ 138,726	29·32	+ 2,867,717	29·32
Iron pig from Canadian ore (c)	Tons.	42,186	613,404	0·59	36,355	450,886	0·33	− 5,831	14·82	− 162,518	26·49
Iron ore sold for export (k)	"	40,137	88,570	0·09	118,129	328,950	0·24	+ 77,992	194·00	+ 240,380	271·00
Lead (d)	Lbs.	23,784,969	827,717	0·80	35,763,476	1,597,554	1·18	+ 11,978,507	50·36	+ 769,837	93·01
Nickel (e)	"	34,098,744	10,229,623	9·91	44,841,542	13,452,463	9·96	+ 10,742,798	31·50	+ 3,222,840	31·50
Silver (f)	Ozs.	32,559,044	17,355,272	16·81	31,955,560	19,440,165	14·40	− 603,484	1·85	+ 2,084,893	12·01
Zinc ore	Tons.	2,590	101,072	0·10	6,415	215,149	0·16	+ 3,825	148·00	+ 114,077	113·00
Total			46,105,423	44·67		61,172,753	45·30			+ 15,067,330	32·69
Non-metallic.											
Actinolite	Tons.	67	736		92	1,000		+ 25	37·31	+ 264	35·87
Arsenious oxide	"	2,097	76,237		2,045	89,262		− 52	2·48	+ 13,025	17·08
Asbestos	"	101,393	2,922,062	2·83	111,561	3,117,572	2·30	+ 10,168	10·03	+ 195,510	6·69
Asbestic	"	26,021	21,046		24,740	19,707		− 1,281	4·92	− 1,339	6·36
Chromite	"	157	2,587					− 157		− 2,587	
Coal	"	11,323,388	26,467,646	25·64	14,512,829	36,019,044	26·67	+ 3,189,441	28·04	+ 9,551,398	36·09
Corundum	"	1,472	161,873	0·15	1,960	239,091	0·18	+ 488	33·15	+ 77,218	47·70
Feldspar	"	17,723	51,939		13,733	30,916		− 3,990	22·51	− 21,023	40·48
Fluorspar	"	34	238		40	240		+ 6	17·65	+ 2	0·80
Graphite	"	1,269	69,576		2,060	117,122		+ 791	62·33	+ 47,546	68·34
" artificial	"	1,086			1,151			+ 65	5·99		
Grindstones	"	4,566	52,942		4,412	52,090		− 154	3·37	− 852	1·61
Gypsum	"	518,383	993,394	0·96	578,458	1,324,620	0·98	+ 60,075	11·59	+ 331,226	33·34
Magnesite	"	991	5,531		1,714	9,645		+ 723	72·96	+ 4,114	74·38
Manganese	"	5½	300		75	1,875		+ 69½		+ 1,575	
Mica	"		128,677	0·12		143,976	0·10			+ 15,299	11·89

Mineral pigments—												
Barytes	Tons.	50	400	.....	464	5,104	.....	+	414	.....	+	4,704	.....
Ochres	"	3,622	28,333	.....	7,654	32,410	.....	+	4,032	111·00	+	4,077	14·39
Mineral water		.....	223,758	0·21	.....	172,465	0·13	.....	.....	.....	-	51,293	22·92
Natural gas (*g*)		.....	1,917,678	1·85	15,286,803	2,362,700	1·75	+	3,642,646	31·28	+	445,022	23·21
Peat	Tons.	1,463	3,817	.....	700	2,900	.....	-	763	52·15	-	917	24·02
Petroleum (*h*)	Bls.	291,092	357,073	0·34	243,336	345,050	0·26	-	47,756	16·41	-	12,023	3·37
Phosphate	Tons.	621	5,206	.....	164	1,640	.....	-	457	73·59	-	3,566	68·50
Pyrites	"	82,666	365,820	0·35	81,526	314,085	0·23	-	1,140	1·38	-	51,735	14·14
Quartz	"	60,526	83,865	.....	100,242	195,216	0·14	+	39,716	65·62	+	111,351	133·00
Salt	"	91,582	443,004	0·42	95,053	459,582	0·34	+	3,471	3·79	+	16,578	3·74
Talc	"	7,300	22,100	.....	8,270	23,132	.....	÷	970	13·29	+	1,032	4·67
Tripolite	"	20	122	.....	38	230	.....	+	18	90·00	+	108	88·52
Total		.....	34,405,960	33·33	.....	45,080,674	33·38	.....	.....	.....	+	10,674,714	31·03

*Short tons throughout. (*a*) The metals copper, lead, nickel, and silver are for statistical and comparative purposes valued at the final average value of the refined metal. Pig iron, zinc ore, and cobalt oxides are valued at the furnace or spot, and non-metallic products at the mine or point of shipment. (*b*) Copper content of smelter products and estimated recoveries from ores exported, at 16·341 cents per pound, in 1912; and 12·376 cents per pound in 1911. (*c*) The total production of pig iron in Canada in 1912 was 1,014,587 tons valued at $14,550,999, of which it is estimated 978,232 tons valued at $14,100,113 should be credited to imported ores; in 1911, the total production was 917,535 tons valued at $12,307,125, of which 875,349 tons valued at $11,693,721 are credited to imported ores. (*d*) Refined lead and lead contained in base bullion exported at 4·467 cents per pound in 1912, and 3·480 cents in 1911, the average prices in Montreal. (*e*) Nickel content of matte produced valued at 30 cents in 1912 and 1911. (Increasing quantities of nickel-copper matte are now being used in making monel metal which is sold at a price much below that of refined nickel). The value of the nickel contained in matte, as returned by the operators, was about 10 cents per pound for both years. (*f*) Estimated recoverable silver at 60·835 cents per ounce in 1912, and at 53·304 cents in 1911. (*g*) Gross returns for sale of gas. (*h*) Quantity on which bounty was paid and valued at $1,418 per barrel in 1912, and at $1.22½ in 1911. (*k*) In 1912 and 1911 figures as reported by the producers, which differ slightly from those of the Trade and Navigation reports.

Comparative Statement of Mineral Production for Years 1911 and 1912.—*Continued.*

Product.	1911.			1912.			Increase (+) or Decrease (−).		Increase (+) or Decrease (−).	
	Quantity.	Value.	Per cent of total.	Quantity.	Value. (a)	Per cent of total.	Quantity.	%	Value.	%
Structural Materials and Clay Products.		$	%		$	%			$	
Cement, Portland ..... Bls.	5,692,915	7,644,537	7·41	7,132,732	9,106,556	6·74	+ 1,439,817	25·29	+ 1,462,019	19·13
Clay products—										
Brick, common..... No.	645,550,517	5,420,890	5·25	769,191,532	7,010,375	5·19	+123,641,015	19·15	+ 1,589,485	29·32
Brick, pressed..... "	87,350,539	1,094,582	1·06	125,180,422	1,609,854	1·19	+ 37,829,883	43·31	+ 515,272	47·07
Brick, paving..... "	5,220,400	79,444	.....	4,579,500	85,989	.....	- 640,900	12·27	+ 6,545	8·24
Brick, moulded and ornamental.....	605,643	11,281	.....	371,356	8,595	.....	- 234,287	38·68	− 2,686	23·81
Fireclay, and fireclay products.....	.....	89,130	.....	.....	125,585	.....	.....	.....	+ 36,455	40·90
Fireproofing and architectural terra-cotta	.....	409,585	0·39	.....	448,853	0·33	.....	.....	+ 39,268	9·59
Pottery.....	.....	102,493	0·10	.....	43,955	.....	.....	.....	- 58,538	57·11
Sewer-pipe	.....	812,716	0·79	.....	884,641	0·65	.....	.....	+ 71,925	8·85
Tile, drain..... No.	.....	339,812	0·32	.....	357,862	0·26	.....	.....	+ 18,050	5·31
Kaolin	.....	.....	.....	20	160	.....	.....	.....	.....	.....
Lime..... Bus.	7,533,525	1,517,599	1·47	8,475,839	1,844,849	1·37	+ 942,314	12·51	+ 327,250	21·56
Sand-lime brick..... No.	51,535,243	442,427	0·43	96,448,402	1,020,386	0·76	+ 44,913,159	87·15	+ 577,959	131·00
Sand and gravel (n). ..... Tons.	573,494	408,110	0·39	.....	1,512,099	1·12	.....	.....	+ 1,103,989	.....
Slate..... Squares	1,833	8,248	.....	1,894	8,939	.....	+ 61	3·33	+ 691	8·38
Stone—										
Granite.....	.....	1,119,865	1·08	.....	1,373,119	1·02	.....	.....	+ 253,254	22·61
Limestone.....	.....	2,594,926	2·51	.....	2,762,936	2·04	.....	.....	+ 168,010	6·47
Marble.....	.....	162,783	0·15	.....	260,764	0·19	.....	.....	+ 97,981	60·19
Sandstone.....	.....	451,183	0·43	.....	329,352	0·24	.....	.....	− 121,831	27·00
Total.....	.....	22,709,611	22·00	.....	28,794,869	21·32	.....	.....	+ 6,085,258	26·80
Grand total	.....	103,220,994	100·00	.....	135,048,296	110·00	.....	.....	+31,827,302	30·83

(a) In 1911, exports; in 1912, partial record only of production.

The detailed comparative statement of production during the years 1911 and 1912, shown in the preceding table, is a gratifying indication of the fact that the Canadian mineral industry in 1912 has had by far the most successful year in its history.

This progress is all the more satisfactory because it is evidently due to a widespread and substantial development of the country's mineral resources. The only new camp of importance to contribute largely to the year's output was Porcupine, the gold production of which was about one and three-quarter million dollars. A slight scarcity of labour was reported, particularly in connexion with the asbestos and clay working industries. There were comparatively few labour disputes to interfere with output, the principal difficulties being a strike of coal miners on Vancouver island, beginning in September, and a labour dispute at Porcupine toward the latter part of the year. The actual output of coal and gold were, however, but slightly affected thereby.

A substantial increase in price in most of the metals, which took place early in the year and continued throughout, had a very important bearing on the year's operations, and contributed largely to the increased value of the output.

A feature of particular interest during the year has been the continued and extended development of ore reserves. The satisfactory results from these operations, particularly in the case of the nickel-copper ores of the Sudbury district, the Porcupine gold ores of Ontario, and a number of the copper and lead deposits of British Columbia, point to much greater annual outputs in the future.

Extension of ore smelting and refining facilities, and in a number of cases special improvements in methods of practice, have also been important factors in the year's operations.

In considering the total value of the mineral production as shown in the general table, due weight should be given to the basis on which the statistics are compiled. It is very difficult to draw a fine line of distinction between what may be termed the first or mine product and the subsequent products resulting from the treatment or manufacture of the mine products, so that in the end a compromise is a practical necessity. Thus in the tabular statement given the quantities of the metals shown are in general the quantities actually recovered or estimated as recovered from the ores shipped from the mines during the year, and the values placed upon them are based on the value of the refined metal in a recognized market. Non-metallic products are valued as at the mine, except in the case of clay products, lime, and cement, for which it appears more feasible to use the manufactured products as a basis of compilation both of quantity and value, the first materials having practically no intrinsic value beyond the labour expended upon them.

On this basis then the production of metalliferous products in 1912 was valued at $61,172,753, being 45·3 per cent of the total mineral output, and an

increase in value over the previous year of $15,067,330, or 32·7 per cent. The value of the production of non-metalliferous products (excluding structural materials and clays) in 1912 was $45,080,674, being 33·38 per cent of the total mineral output, and an increase of $10,674,714, or 31 per cent, over the value of the production in 1911.

The value of the production of clay products, lime, and stone, and other similar structural materials in 1912, was $28,794,869, or 21·3 per cent of the total production, and an increase of $6,085,258, or 26·8 per cent over the 1911 output.

It will be observed that these three classes of products maintained very nearly the same relative proportion of total output as in 1911.

Coal, which has for a number of years past been the most important product in point of value, maintained its position in 1912, contributing 26·6 per cent of the total value, as against 25·6 per cent in 1911. Silver was next in importance in both years, accounting for 14·4 per cent of the total in 1912 as compared with 16·8 per cent in 1911. Nickel, copper, and gold followed in the order named in 1912, each being credited with between 9 and 10 per cent. Clay products contributed 7·62 per cent, and cement 6·74 per cent. Copper advanced from seventh place in value of production in 1911 to fourth position in 1912.

In the case of iron only the amount of pig iron produced from Canadian ore is included in the general total. There is an important production of pig iron from imported ore (shown in the footnotes of the general table) and the total value thereof in 1912 exceeds that of the production of any other metal, with the exception of silver. There is also a large production of aluminium from imported ores for which no value is included in the general table of production.

The prices of metals upon which the value of the production directly depends showed in several cases important increases in the beginning of the year, which were well maintained throughout.

The average prices of nearly all metals were higher in 1912. Copper advanced from 12·376 cents per pound to 16·341 cents, an increase of 3·965 cents, or 32 per cent. The average price of lead in Montreal increased from 3·48 cents to 4·467 cents per pound, a gain of 0·987 cent, or 28 per cent.

Silver advanced from 53·304 cents to 60·835 cents per ounce on the New York market, a gain of 7·531 cents, or over 14 per cent.

The average price of spelter in New York increased from 5·768 cents per pound to 6·943 cents in 1912, and tin from 42·281 cents per pound in 1911 to 46·096 cents per pound in 1912.

Metal Prices.

—	1907.	1908.	1909.	1910.	1911.	1912.
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
Copper, New York	20·004	13·208	12·982	12·738	12·376	16·341
Lead "	5·325	4·200	4·273	4·446	4·420	4·471
" London	4·143	2·935	2·839	2·807	3·035	3·895
" Montreal *	4·701	3·364	3·268	3·246	3·480	4·467
Nickel, New York	45·000	43·000	40·000	40·000	40·000	40·000
Silver "	65 327	52 864	51·503	53 486	53·304	60·835
Spelter "	5·962	4·720	5·503	5·520	5·758	6·943
Tin "	38·156	29·465	29·725	34·123	42·281	46·096

* Quotations furnished by Messrs. Thomas Robertson & Company, Montreal, Que.

With the exception of petroleum every important mineral mined in Canada shows an increased production in 1912, in so far as value is concerned. In the case of silver only is there a decrease in quantity, and this slightly less than 2 per cent, the increase in total value of silver being due to the much higher price obtained for the metal during the year. Among the metals, increases in quantity of output are shown as follows: pig iron 10·5 per cent; gold 28 per cent; copper 40 per cent, and lead 50 per cent. On account of the generally higher prices of the metals the increases in total value of output considerably exceed the increases in quantity, and are as follows: silver 12 per cent, nickel 31 per cent, copper 85 per cent, and lead 93 per cent.

The most important increases amongst non-metallic products are in coal, asbestos, gypsum, natural gas, and all of the structural materials. Coal shows an increase of 28 per cent in tonnage, asbestos 10 per cent, gypsum 11 per cent, natural gas 31 per cent in number of cubic feet. Cement increased 25 per cent in quantity and 19 per cent in total value, clay products 26·5 per cent in value, stone 9·2 per cent in value, and lime 12·5 per cent in quantity and 21·5 per cent in value.

It is a matter of regret to have to report a continued decrease in the production of petroleum. The Canadian output of this product a few years ago was about 50 per cent of domestic consumption. At the present time not over 5 per cent of Canada's consumption of petroleum and its products is derived from domestic sources.

EXPORTS AND IMPORTS.

A very large portion of the mineral production of Canada is exported for consumption or refining outside of Canada. On the other hand considerable quantities of mine products, chiefly those which have been refined or subjected to partial treatment, or in the form of manufactured goods ready for consumption, are imported.

The total value of the exports of products of the mine, including direct mine products and manufactures thereof, in 1912 was $68,591,225, as compared with $52,546,593 in 1911. This value includes for 1912 mine products to the value of $54,349,640, and manufactures valued at $14,241,585. Practically the whole of the Canadian production of copper, nickel, and silver is exported, also a very large proportion of the production of gold, asbestos, and mica. There are also considerable exports of coal. These items alone contribute about 95 per cent of the value of the mine products exported. Manufactures of mine products exported consist chiefly of iron and steel goods, aluminium, calcium carbide, lime, acetate of lime, and coke.

The United States is the chief destination of Canada's mine exports, about 80 per cent having been exported to that country during the fiscal year 1911-1912, and about 13·4 per cent to Great Britain.

A great variety of mineral products, chiefly in a manufactured or semi-manufactured condition, are annually imported into Canada, and these imports are increasing with much greater rapidity than is Canada's domestic mineral production. The total value of such imports during the calendar year 1912 was $233,924,270, as compared with imports valued at $181,773,708 in 1911, and $147,305,012 in 1910. Of the total imports in 1912 nearly $50,000,000 in value was made up of the cruder forms of mineral products such as coal, ores of metals, diamonds unset and bort, asphaltum, etc., as against $48,000,000 for similar items in 1911. The imports of iron and steel and manufactures thereof in 1912 were valued at $124,376,986, as against $93,171,817 in 1911, and $75,758,594 in 1910. Imports of the metals, aluminium, antimony, copper, gold, silver, lead, platinum, tin, and zinc, and manufactures thereof, and metallic alloys, reached a total value of over $27,000,000, as compared with $19,500,000 in 1911, petroleum and products of, $11,858,533, as against $6,009,730 in 1911; clays and clay products, $6,592,537, as against $5,216,544 in 1911.

It will thus be seen that over 50 per cent of the imports represents iron and steel, and that the increased imports were chiefly in iron and steel and other metals, and in petroleum.

As has already been pointed out in previous reports the great excess of imports over exports would seem to indicate the existence of large opportunities for the development not only of Canada's mineral production, but also of many manufacturing industries which utilize mine products as raw materials.

No matter what Canada's development in industrial activity may be in the future, it seems certain that there must always be a large and mutually advantageous interchange of trade between this country and our neighbour to the south. Thus, notwithstanding Canada's possession of large supplies of coal, both in the east and in the west, the great central provinces of the country, at present the most highly populated, are situated nearer the coal fields of Pennsylvania and Ohio, and derive their chief supplies from that source, while similarly, British Columbia and Alberta coal is finding a considerable market in the adjacent

states of the United States. Our southern neighbours have developed the largest iron and steel industry of any of the world powers, and possess highly developed industries in the treatment and refining of metals of all kinds, and it is perhaps but natural that we send to them the greater part of our metal ores and smelter products, and take from them the refined and manufactured products.

In the case of lead Canada now refines practically the whole of the domestic ore production, and the exports in 1912 were insignificant. Similar development in the future will no doubt result in the refining in Canada of copper, nickel, zinc, and other metals. In like manner, the continued large export of crude unrefined ores and the corresponding imports of refined and manufactured products still point to opportunities for the development of industries for the treatment, refinement, and manufacture of non-metallic products.

EXPORTS.

Exports of the Products of the Mine and of Manufactures of Mine Products—Calendar Years 1911 and 1912.

		1911.		1912.	
		Quantity.	Value.	Quantity.	Value.
MINE PRODUCTS.			$		$
Arsenic	Lbs.	4,125,558	81,761	3,847,906	101,310
Asbestos	Tons	75,120	2,067,259	88,008	2,349,353
Barytes	Cwt.	...	...	68	74
Coal	"	1,500,639	4,357,074	2,127,133	5,821,595
Copper, fine in ore, etc	Lbs.	55,208,054	5,489,770	76,542,643	8,800,267
" black or coarse and in pigs	"	79,656	7,955	1,945,921	236,212
Feldspar	Tons	16,150	56,085	12,779	44,114
Gold		...	7,493,523	...	10,014,654
Gypsum	Tons	362,102	425,161	364,643	423,208
Lead, in ore, etc	Lbs.	65,100	1,826	299,240	8,193
" in pig, etc	"	71,961	2,806	...	...
Mica	"	693,940	242,548	895,338	334,054
Mineral pigments	"	3,999,925	27,070	6,032,640	34,513
Mineral water	Gals.	26,495	12,952	9,690	4,710
Nickel, in ore, etc	Lbs.	32,619,971	3,676,396	44,221,869	4,661,758
Oil, mineral, crude, etc	Gals.	...	...	18,500	3,964
Oil, refined	"	489	73	36,945	6,147
Ores—					
Antimony	Tons	37	4,946	...	...
Corundum	"	742	77,777	1,928	205,819
Iron	"	37,686	123,411	118,129	382,005
Manganese	"	4	225	10	300
Other ores	"	6,919	375,695	15,573	530,270
Phosphate	"	3	100	...	...
Platinum	Ozs.	39	961	92	3,821
Plumbago	Cwt.	16,263	43,249	33,074	70,763
Pyrites	Tons	32,102	120,585	5,938	11,935
Salt	Lbs.	454,600	5,055	289,150	3,723
Sand and gravel	Tons	573,494	408,110	660,090	459,952
Silver	Ozs.	31,216,725	15,807,366	34,911,922	19,494,416
Stone, building	Tons	83,767	25,103	108,516	28,795
" ornamental	"	168	1,796	2,339	1,826
" for manufacture of grindstones	"	15	22	...	...
Other products of the mine		...	204,028	...	311,851
Total mine products		...	41,121,688	...	54,349,640

EXPORTS.

Exports of the Products of the Mine and of Manufactures of Mine Products—Calendar Years 1911 and 1912—*Continued.*

—		1911.		1912.	
		Quantity.	Value.	Quantity.	Value.
MANUFACTURES.			$		$
Acetate of lime	Lbs.	7,428,157	117,904	14,691,678	312,262
Agricultural implements—					
Cultivators	No.	5,923	138,377	5,059	100,043
Harrows	"	5,412	95,904	4,734	100,579
Harvesters	"	14,356	1,432,911	15,341	1,634,208
Hay rakes	"	11,085	317,842	6,646	199,092
Mowing machines	"	22,859	778,274	16,213	562,502
Parts of	....	....	796,246	....	577,895
Ploughs	No.	20,437	508,095	13,580	412,460
Reapers	"	9,385	574,315	3,243	195,156
Seeders	"	174	13,795	70	7,040
Threshing machine	"	339	92,442	761	214,499
All other	"	....	1,533,728	....	1,964,071
Aluminium, in bars	Cwt.	49,901	747,567	182,857	2,002 363
" manufactures of	"	....	1,555	....	10,898
Bricks	M	394	3,977	694	8,493
Calcium carbide	Lbs.	4,888,975	142,402	7,549,137	230,503
Cement	....	....	4,067	....	2.436
Clay, manufactures of	....	....	2,071	....	256
Coke	Tons	9,852	39,823	57,744	252,763
Earthenware, and all manufactures of	....	....	6,101	....	10,001
Grindstones, manufactured	....	....	29,184	....	26,535
Gypsum and plaster ground	....	....	4,429	....	6,495
Iron and steel :—					
Castings, N.E.S	....	....	33,441	....	27,113
Gas buoys and parts of	....	....	68,485	....	83,583
Hardware, tools, etc.	....	....	94,513	....	91,731
" N.E.S.	....	....	44,199	....	48,474
Machinery (Linotype machines)	....	....	12,239	....	6,555
" N.E.S.	....	....	431,493	....	474,996
Pig iron	Tons	5,870	271,968	6,976	310,702
Scrap iron and steel	Cwt.	84,153	54,618	332,641	145,250
Sewing machines	No.	18,519	218,075	24,158	259,617
Steel and manufactures of	....	....	769,692	....	795,731
Stoves	No.	1,176	20,626	1,390	21,110
Typewriters	"	4,771	318,935	4,025	277,583
Vehicles—					
Automobiles	"	1,509	1,184,506	3,028	2,013,784
" parts of	....	....	45,798	....	105,330
Bicycles	No.	90	5,936	101	9,058
" parts of	....	....	50,828	....	54,322
Lime	....	....	53,536	....	35,097
Metals, N.O.P.	....	....	175,716	....	261,752
Naphtha and gasoline	Gals.	23,959	4,427	25,791	4,261
Oil, N.E.S.	"	....	....	397,039	119,686
Phosphorus	Lbs.	....	....	543,620	66,806
Plumbago, manufactures of	....	....	33,956	....	58,920
Stone, building	....	....	456	....	163
" ornamental	....	....	980	....	2,458
Tar	....	....	56,669	....	76,261
Tin, manufactures of	....	....	30,176	....	69,692
Total manufactures	....	....	11,424,905	....	14,241,585
Grand total	....	....	52,546,593	....	68,591,225

EXPORTS.

Showing Destination of Mine Products during the Fiscal Years 1909-10, 1910-11, and 1911-12.

Destination.	1909-10 Value.	1910-11 Value.	1911-12 Value.
	$	$	$
United States	33,488,464	33,129,505	33,259,580
United Kingdom	3,820,574	6,726,015	5,555,599
Newfoundland, and Labrador	528,031	580,632	618,766
Hong Kong	216,514	376,553	434,202
Alaska	.....	392,715	305,086
Germany in Europe	43,975	239,596	248,925
Australia and Tasmania	212,950	161,017	178,260
Mexico	325,153	302,065	159,345
Chinese Empire	777,147	301,870	103,904
Belgium	177,675	220,244	101,661
France	110,222	116,326	74,487
Bermuda	53,071	66,525	62,494
Japan	202,071	85,247	58,773
St. Pierre and Miquelon islands	28,450	24,941	30,205
Argentina	4,516	1,383	24,313
Cuba	14,946	10,161	21,590
Portuguese Africa	.....	.....	20,340
Chili	.....	.....	19,669
British West Indies	13,552	11,904	13,635
British South Africa	.....	.....	10,460
Holland and Netherlands	17,218	21,609	5,260
Italy	10,956	8,000	4,358
Peru	.....	.....	3,682
Philippines	.....	.....	2,824
Dutch Guiana	.....	48	1,492
Spain	.....	.....	1,471
Austria-Hungary	1,030	720	1,410
New Zealand	8,518	2,309	1,060
San Domingo	.....	1,000	1,000
Denmark	.....	.....	448
Switzerland	73	300	159
Uruguay	.....	1,742	68
Other countries	31,911	5,144	
Totals	40,087,017	42,787,561	41,324,516

IMPORTS.

Imports of Products of the Mine and Manufacture of Mine Products—Calendar Years 1911 and 1912.

Products.	1911 Value.	1912 Value.
	$	$
Alumina	372,009	448,061
Alum, alum cake, and chloralum	88,516	151,850
Aluminium and manufactures	648,046	539,705
Antimony	36,405	60,456
Antimony salts	2,418	7,197
Arsenic, oxide and sulphide of	6,823	21,153
Asbestos	319,815	461,449
Asphaltum	558,784	803,456
Bells and gongs	104,985	110,015
Bismuth	7,012	6,378
Blanc fixe and satin white	29,706	34,794
Blast furnace slag	141,136	110,148
Borax	120,213	112 022
Brick and tile	1,555,347	2,255,569
Brick, fire, of a kind not made in Canada	814,414	953,621
Bromine	40	145
Burrstones	1,642	1,469
Cement, Portland and manufactures	848,416	1,979,227
Chalk, Cornwall stone, feldspar, fluorspar, etc	147,640	167,980
Clays	270,247	288,384
Coal, anthracite, bituminous, slack, and run of mine	39,292,591	39,478,037
Coal tar and coal pitch	81,555	217,861
Coke	1,843,248	1,358,451
Coke, ground for electric batteries	6,840	4,792
Copper and manufactures of	4,936,769	7,047,356
Cryolite	29,602	56,591
Crucibles, clay or plumbago	56,814	82,324
Chloride of lime	118,501	113,346
Cyanides of potassium, sodium, cyanogen, or cpd of bromine	94,397	143,978
Diamonds, unset, and bort	2,612,150	3,623,424
Earthenware	2,516,536	3,094,956
Earths, crude	9,398	13,007
Electric carbons	56,529	58,951
Emery	150,444	177.187
Fertilizers, compound or manufactured	386,645	580,351
Flint, quartz, silex, etc	56,624	50,571
Foundry facings	21,816	23,536
Fullers earth	7,024	10,390
Fossils	1,180	3,994
Gannister	2,821	2,151
Gold and silver and manufactures	2,480,017	3,618,701
Graphite and manufactures of	56,132	73,160
Grindstones	123,356	112,029
Gypsum and plaster of Paris	205,782	268,103
Iron and steel—Total, 1911, $93,171,817; 1912, $124,376,986		
Agricultural implements	4,508,094	4,358,074
Bar iron or steel, rolled, whether in coils, bundles, rods or bars	3,017,349	3,561,709
Castings, iron or steel, N.O.P.	1,073,587	1,592,930
Cutlery	1,041,412	1,337,782
Engines, locomotive [illegible] others	1,741,626	2,915,601
Iron, pig	2,610,989	3,512,969
Iron or steel bloo[illegible]lets, puddled bar[illegible]d loops, ingots, cogged ingots, slabs, or [illegible]r forms, N.O.P.,	1,671,207	1,558,393
Iron or steel, roll[illegible]ngles, tees, beams, c[illegible]ls, girders, etc	5,091,695	6,636,978
" " rol[illegible]lates, not less than 30 [illegible]de or ¼" thick	1,583,123	1,750,175
" " ro[illegible] plate, universal mill or rolled edge bridge plates	857,537	1,158,155
" " skelp, sheared or rolled in grooves, etc	1,914,819	2,631,207
" " sheets, flat galvanized, Canada plates, etc	4,187,900	6,556,517
Machines and machinery	28,250,006	37,826,662
Steel rails	2,583,486	3,761,108
Tubing	2,372,182	4,044,377
Tools and implements	1,091,073	1,501,799

IMPORTS.

Imports of Products of the Mine and Manufactures of Mine Products—Calendar Years 1911 and 1912—*Continued.*

Products.	1911. Value.	1912. Value.
	$	$
Iron and steel—*Con.*		
Wire	3,617,766	4,781,714
All other iron and steel and manufactures of	25,737,996	34,890,856
Iron ore	(a)	(b)3,932,074
Iron sand	8,340	13,347
Kainite	9,262	231
Lead and manufactures; litharge	1,049,276	1,805,221
Lime	161,985	207,481
Lithographic stone	12,344	7,081
Manganese, oxide of	22,612	27,707
Magnesia	11,012	29,641
Meerschaum	150	109
Mercury or quicksilver	67,416	72,171
Metallic alloys:—		
Babbitt metal	36,073	49,387
Brass and manufactures of	3,218,942	4,982,531
Britannia metal	32,430	53,585
German silver, nickel and nickel silver	147,315	172,344
Type metal	321	1,195
Mineral and bituminous substances	168,577	191,241
Mineral water, including aerated water	229,367	273,698
Nickel anodes	34,199	23,125
Ochres, etc	53,092	69,626
Ores of metals, N.O.P	(c)4,014,748	927,421
Paraffin wax	75,661	85,494
Paraffin candles	30,763	34,028
Petroleum and products of	6,009,730	11,858,539
Phosphate (fertilizer)	46,217	24,583
Platinum and manufactures of	176,101	232,161
Potash and manufactures of	203,980	324,968
Precious stones	344,659	522,298
Pumice	18,779	21,310
Salt	436,118	485,959
Saltpetre	101,082	100,509
Sand and gravel	240,613	445,781
Slate and manufactures of	169,685	200,643
Sand paper	164,474	189,782
Soda products: barilla, bichromate, caustic, salt, and salt cake	800,805	896,070
Stone and manufactures of (including marble)	1,140,846	1,467,143
Soda, nitrate of	867,778	1,537,379
Sulphate of iron (copperas)	4,773	5,178
Sulphur and phosphorus	450,875	810,702
Sulphuric acid	9,281	35,325
Talc	6,413	4,414
Tin and manufactures of (including tinware)	5,442,551	6,697,165
Whiting and prepared chalk	136,022	162,864
Zinc and manufactures of	1,227,660	1,824,519
	181,773,708	233,924,270

(*a*) In 1911 included in ores of metals, N.O.P.; (*b*) nine months only; includes iron ore in 1911.

METALLIC ORES AND PRODUCTS.

Antimony. The production of antimony during the past two years was limited to a few pounds of refined antimony recovered at the lead refinery at Trail, B.C. Shipments of antimony ore in 1910 were reported as 364 tons, valued at $13,906, whilst there was no production of refined antimony in 1910. There is no export of antimony ore recorded in 1912, as against 50 tons valued at $4,946, in 1911. The imports of antimony or regulus thereof, in 1912, were 998,045 pounds, valued at $99,456, and of antimony salts 55,683 pounds, valued at $7,197, or a total value of imports of $67,653. In 1911, the imports were antimony and regulus of 561,046 pounds, valued at $36,405, and antimony salts 18,420 pounds, valued at $2,418, or a total value of $38,823.

Cobalt.—Cobalt oxide and cobalt material are being produced in Canadian smelters, the production in 1912 of cobalt oxide and nickel oxide being 349,054 pounds, valued at $156,256, and of cobalt material and mixed cobalt and nickel oxides 1,285,280 pounds, valued at $163,988. During 1911, the shipments included 154,174 pounds of cobalt and nickel oxide, and 1,260,832 pounds of cobalt material and mixed cobalt and nickel oxides, the value being $221,690.

Copper. The production of copper contained in blister, matte, or ore, which was practically all exported, was 77,832,127 pounds in 1912, valued at $12,718,548, as compared with 55,648,011 pounds in 1911, valued at $6,886,998.

The exports in 1912 were reported as 78,488,564 pounds, valued at $9,036,479, as against exports of 55,287,710 pounds, valued at $5,467,725, in 1911. The total imports of copper in 1912 were valued at $7,047,356; and included crude and manufactured copper to the extent of 42,832,747 pounds, valued at $6,741,895, together with other manufactures of copper of which the quantity is not recorded, valued at $305,461. The copper imports in 1911 were valued at $4,936,769, including 37,352,237 pounds of crude and manufactured copper, valued at $4,721,480, and other copper manufactures of which the quantity is not recorded, valued at $215,289.

Gold.—The total value of the production of gold in 1912 was $12,648,794, representing 611,485 fine ounces, as compared with $9,781,077, representing 473,159 fine ounces of metal in 1911.

The Yukon placer production in 1912 was 267,988 fine ounces, valued at $5,539,808.

Of the total production in 1912 about $6,106,677 were derived from alluvial workings; $2,270,331 as bullion from milling ores, and $4,271,786 from ores and concentrates sent to smelters. In 1911, $5,014,207 were derived from alluvial workings; $513,991 as bullion from milling ores, and $4,252,879 from ores and concentrates sent to smelters.

The exports of gold-bearing dust, quartz, nuggets, and gold in ore, etc., in 1912, were valued at $10,014,654, as against $7,493,523 in 1911.

The imports of gold coin during the calendar year 1912 were $7,496,492, and of gold bullion $1,360,735.

Pig Iron.—The total production of pig iron in Canadian blast furnaces in 1912 was 1,014,587 tons, valued at $14,550,999, of which it is estimated 978,232 tons, valued at $14,109,113, should be credited to imported ores, and 36,355 tons, valued at $450,886, to domestic ores. In 1911 the total production was 917,535 tons, valued at $12,307,125, of which 875,349 tons, valued at $11,693,721, should be credited to imported ores, and 42,186 tons, valued at $613,404, to domestic ores.

The exports of pig iron, including ferro-products, in 1912, were 6,976 tons, valued at $310,702, as against 5,870 tons, valued at $271,968, in 1911. The imports of pig iron in 1912 were 272,565 tons, valued at $3,511,599, ferro-manganese, etc., 19,810 tons, valued at $469,884, and charcoal pig 115 tons, valued at $1,370, as compared with imports in 1911 of pig iron 208,487 tons, valued at $2,610,989, and ferro-manganese, etc., 17,226 tons, valued at $429,465.

The total exports of iron and steel and manufactures thereof, in 1912, were valued at $10,682,484, as against $9,907,281 in 1911. The imports of iron and steel and manufactures thereof during the calendar year 1912 were valued at $124,376,986, as compared with $93,171,817 during the calendar year 1911.

Iron Ore.—The total shipments of iron ore from Canadian mines in 1912 were 215,883 tons, valued at $523,315, as compared with 210,344 tons, valued at $522,319, in 1911. The exports of iron ore in 1912 were 118,129 tons, valued at $382,005, as against 37,686 tons, valued at $123,411, in 1911. The quantity of imported iron ore used in Canada in 1912 was about 2,019,165 tons, as compared with 1,628,368 tons of imported ore used in 1911.

Lead.—The production of lead in 1912 was 35,763,476 pounds, valued at $1,597,554, as against 23,784,969 pounds, valued at $827,717, in 1911. The exports of lead in 1912 were: lead in ore, etc., 299,240 pounds, valued at $8,193; while in 1911 the exports were: lead in ore, etc., 65,100 pounds; pig lead, 71,961 pounds—total, 137,061 pounds. The total value of the imports of lead and manufactures of, in 1912, was $1,806,221, as compared with imports in 1911, valued at $1,049,276.

Nickel.—The production of nickel contained in nickel-copper matte produced in Canada and exported for refinement was, in 1912, 44,841,542 pounds, as compared with a production of 34,098,744 pounds in 1911. During 1912 there were smelted 725,065 tons of ore, producing 41,925 tons of matte, as against 610,834 tons of ore smelted in 1911, producing 32,607 tons of matte. Small quantities of nickel oxide are also produced in connexion with the treatment of the Cobalt District silver ores. The exports of nickel contained in ore, matte, etc., during 1912, were 44,221,860 pounds, valued at $4,661,758: being 5,072,867 pounds to Great Britain and 39,148,993 pounds to the United States. In 1911 the exports were 32,619,971 pounds, valued at $3,676,396: being 5,023,393 pounds

to Great Britain and 27,596,578 pounds to the United States. The imports of nickel and nickel anodes in 1912 were valued at $23,125, as against a value of $34,199 imported in 1911.

Silver.—The production of silver contained in bullion, or estimated as recovered from mattes and ore, etc., exported, was in 1912, 31,955,560 fine ounces valued at $1,440,165, as compared with a production of 32,559,044 fine ounces, valued at $17,355,272, in 1911. About 91·4 per cent of the production in 1912 was derived from "Cobalt District" of Ontario. The production of silver in 1905 was only 6,000,023 ounces, and in 1900, 4,468,225 ounces. The exports of silver contained in ores, mattes, etc., in 1912, were 34,911,922 ounces, valued at $19,494,416; as against exports of 31,216,725 ounces, valued at $15,807,366, in 1911. The imports of silver bullion during the calendar year 1912 were valued at $1,100,344, as compared with bullion imports of $847,645 in 1911.

Zinc.—The shipments of zinc ore in 1912 were 6,415 tons, valued at $215,149, as compared with shipments of 2,590 tons, valued at $101,072, in 1911. The total value of the imports of zinc and manufactures of zinc, in 1912, was $1,824,519, as compared with imports, valued at $1,227,660, in 1911.

NON-METALLIC PRODUCTS.

Actinolite.—A production of 92 tons, valued at $1,000, was reported in 1912, as compared with 67 tons, valued at $736, in 1911.

Arsenic.—Smelter returns show a production in 1912 of 2,045 tons of arsenious oxide, valued at $89,262, as compared with a production in 1911 of 2,097 tons, valued at $76,237.

The exports of arsenic in 1912 were 1,924 tons, valued at $101,310, as against 2,063 tons, valued at $81,761, in 1911. The imports of arsenious oxide in 1912 were 76,528 pounds, valued at $1,722, as compared with 7,338 pounds, valued at $158, in 1911. The imports of sulphide of arsenic in 1912 were 451,928 pounds, valued at $19,431, and in 1911, 330,170 pounds, valued at $6,665.

Asbestos.—The shipments of asbestos in 1912 were 111,561 tons, valued at $3,117,572, and of asbestic, 24,740 tons, valued at $19,707. The shipments in 1911 were 101,393 tons, valued at $2,922,062, and of asbestic 26,021 tons, valued at $21,046. The shipments in 1912 consisted of 5,662·9 tons of crude asbestos, valued at $890,351, and 105,898 tons of mill stock, valued at $2,227,221. Considerable quantities both of crude and of mill stock were held in manufacturers' hands at the close of the year.

Exports in 1912 were 88,008 tons, valued at $2,349,353, as against 75,120 tons, valued at $2,067,259, in 1911.

Imports and manufactures of asbestos in 1912 were valued at $461,449, and in 1911, $319,815.

Chromite.—During 1912 no shipments of chromite were reported. Shipments from stock in 1911 were 157 tons, valued at $2,587.

Coal.—The production of coal in 1912 was 14,512,829 tons, valued at $36,019,044, as against 11,323,388 tons, valued at $26,467,646, in 1911. The exports of coal in 1912 were 2,127,133 tons, valued at $5,821,593, as compared with 1,500,639 tons, valued at $4,357,074, in 1911. The total imports of coal in 1912 were 14,595,810 tons, valued at $39,478,037, as against imports in 1911 of 14,558,892 tons, valued at $39,292,591.

The 1912 imports included 8,491,840 tons of bituminous round and run of mine coal, valued at $16,846,727; 4,184,017 tons of anthracite and anthracite dust, valued at $20,080,388; and 1,919,953 tons of bituminous slack, such as will pass through a ¾" screen, valued at $2,550,922.

In 1911 the imports included 8,905,815 tons of bituminous round and run of mine, valued at $18,407,603; 4,020,577 tons of anthracite and anthracite dust, valued at $18,794,192; and 1,632,500 tons of bituminous slack, such as will pass through a ¾" screen. The consumption of coal in 1912 was approximately 26,924,800 tons, as against 24,247,698 tons in 1911.

Coke.—The total quantity of oven coke made in 1912 was 1,406,028 tons, the quantity sold or used was 1,411,229 tons, valued at $5,164,331; as compared with 954,388 tons made and 935,651 tons sold or used, valued at $3,630,410, in 1911. The quantity of coal charged to coke ovens, in 1912, was 2,053,807 tons, as compared with 1,409,844 tons in 1911. The exports of coke in 1912 were 57,744 tons, valued at $252,763, and, in 1911, 9,852 tons, valued at $39,823. The imports of coke in 1912 were 496,830 tons, valued at $1,358,451, as compared with imports of 751,389 tons, valued at $1,843,248, in 1911.

Corundum.—The total sales of grain corundum in 1912 were 1,960 tons, valued at $239,091, as compared with sales in 1911 of 1,472 tons, valued at $161,873. Exports for 1912 were 1,928 tons, valued at $205,819.

Feldspar.—Shipments of feldspar in 1912 were 13,733 tons, valued at $30,916, as compared with 17,723 tons, valued at $51,939, in 1911. The exports are recorded as 12,779 tons, valued at $44,114, in 1912, and 16,150 tons, valued at $56,088 in 1911.

Fluorspar.—About 40 tons, valued at $240, were shipped from the mine in 1912, and 34 tons, valued at $238, in 1911. Canadian furnaces in 1912 used 9,709 tons of fluorspar. Imports of hydro-fluo-silicic acid were 302,918 pounds, valued at $24,891.

Graphite.—Shipments of crude and milled graphite during 1912 totalled 2,060 tons, valued at $117,122, as against 1,269 tons, valued at $69,576, in 1911. The production of artificial graphite in 1912 was reported as 1,151 tons, as compared with 1,086 tons in 1911.

Exports of plumbago in 1912 are reported as 1,654 tons, valued at $70,763, and manufactures of plumbago valued at $58,920. Exports in 1911 were: plumbago 813 tons, valued at $43,249, and manufactures of plumbago valued at $33,956. Imports of graphite in 1912 were valued at $155,484, and included: plumbago not ground $7,249; blacklead $9,587; plumbago ground and manufactures of, $56,324; and crucibles of clay or plumbago, $82,324. In 1911 the imports were valued at $112,946, including: plumbago not ground $4,940; blacklead $14,172; plumbago ground and manufactures of, $37,020; and crucibles of clay or plumbago $56,814.

Grindstones.—The production of grindstones, scythestones, and wood pulpstones, in 1912, was 4,412 tons, valued at $52,090, as compared with 4,566 tons, valued at $52,942, in 1911. The exports in 1912 were manufactured grindstones valued at $26,535; the exports in 1911 were stone for the manufacture of grindstones, 15 tons valued at $22, and manufactured grindstones valued at $29,184. The imports of abrasives in 1912 included: grindstones valued at $112,020; burrstones, $1,409; emery in bulk, crushed or ground, $46,616; manufactures of emery, carborundum, etc., $130,571; pumice stone, $21,310; also iron sand, $13,347; sandpaper, $189,782. The 1911 imports comprised: grindstones valued at $123,356; burrstones, $1,642; emery in bulk crushed or ground, $46,274, manufactures of emery, carborundum, etc., $104,170; pumice stone, $18,779; also iron sand, $8,340; sandpaper, $164,474.

Gypsum.—The total shipments of gypsum, crude and calcined, in 1912, were 578,458 tons, valued at $1,324,620, as compared with shipments of 518,383 tons, valued at $993,394, in 1911. The tonnage of gypsum mined or quarried in 1912 was 549,856 tons, and the quantity calcined 133,392 tons. In 1911, 495,979 tons of gypsum were mined or quarried and 76,718 tons calcined. The shipments in 1912 included: crude gypsum 453,577 tons, valued at $525,345; ground gypsum 15,487 tons, valued at $29,244, and calcined gypsum 109,394 tons, valued at $770,031. In 1911 shipments comprised: crude gypsum 449,823 tons, valued at $481,077; ground gypsum 7,149 tons, valued at $23,125, and calcined gypsum 61,411 tons, valued at $489,192. The exports of gypsum in 1912 were: 364,643 tons of crude gypsum, valued at $423,208, and gypsum ground or calcined valued at $6,495. The 1911 exports were: 362,102 tons of crude gypsum, valued at $425,161, and gypsum ground or calcined valued at $4,429.

The imports of gypsum in 1912 were valued at $268,103, including: crude gypsum, 3,503 tons, valued at $16,254; ground gypsum, 7,072 tons, valued at $19,651, and plaster of Paris, 32,496 tons, valued at $232,198. The total value of imports in 1911 was $205,782, made up of: crude gypsum 2,035 tons, valued at $11,792; ground gypsum 11,208 tons, valued at $3,619; and plaster of Paris, 28,518 tons, valued at $190,371.

Magnesite.—Shipments of magnesite in 1912 were 1,714 tons, valued at $9,645, and in 1911, 991 tons, valued at $5,531. Imports of magnesia in 1912 were 758,909 pounds, valued at $29,641.

Manganese.—There was a shipment of 75 tons, valued at $1,875, in 1912, as against 5½ tons, valued at $300, in 1911. The exports in 1912 were 10 tons, valued at $300, as against 4 tons, valued at $225, in 1911. The 1912 imports included 1,256 tons manganese oxide, valued at $27,707, as compared with 962 tons, valued at $22,612, in 1911.

Mica.—The value of the mica production in 1912 as reported by mine operators was $143,976, as compared with $128,677 in 1911. The exports of mica in 1912 were 895,338 pounds, valued at $334,054, as against 693,940 pounds, valued at $242,548, in 1911.

Mineral Pigments.—Shipments of barytes in 1912 were 464 tons, valued at $5,104, as against 50 tons, valued at $400, in 1911. The production of iron ochres in 1912 was 7,654 tons, valued at $32,410, as compared with 3,622 tons, valued at $28,333, in 1911.

In 1912 the exports of barytes were 68 hundredweight, valued at $114. The exports of iron oxides in 1912 were 3,016 tons, valued at $34,513, as against 2,000 tons, valued at $27,070, in 1911. The imports in 1912 were: ochres and ochrey earth and raw siennas, 1,737 tons, valued at $40,165; and oxides, dry fillers, fireproof umbers, and burnt siennas, 762 tons, valued at $29,456, as compared with imports in 1911, comprising: ochres and ochrey earth and raw siennas 1,477 tons, valued at $32,032; and oxides, dry fillers, fireproof umbers, and burnt siennas, 722 tons, valued at $21,060.

Mineral Water.—The value of the production of mineral water in 1912 for which returns were received was $172,465, as compared with a value of $223,758 in 1911. The imports of mineral and aerated waters in 1912 were valued at $273,698, as against a value of $229,367 in 1911. The exports in 1912 were valued at $4,667, as against $12,952 in 1911.

Natural Gas.—The value of the production of natural gas in 1912 was 15,287 million cubic feet, valued at $2,362,700, as compared with 11,644 million cubic feet, valued at $1,917,678, in 1911.

Peat.—Shipments of peat for fuel purposes in 1912 were 700 tons, valued at $2,900, as compared with 1,463 tons, valued at $3,817, in 1911.

Petroleum.—The production of crude petroleum shows a further falling off in 1912, the production being 243,336 barrels or 8,516,762 gallons, valued at $345,050; as compared with 291,092 barrels or 10,188,219 gallons, valued at $357,073, in 1911.

Exports of refined oil in 1912 were 36,945 gallons, valued at $6,147, and 489 gallons, valued at $73, in 1911. There was an export in 1912 of naphtha and gasoline of 25,791 gallons, valued at $4,261, and also an export of other oils, N.E.S. of 397,039 gallons, valued at $119,686, which may have included products of petroleum.

While the production has been decreasing the imports have been increasing; the total import of petroleum oils, crude and refined, in 1912, was 186,787,484 gallons, valued at $11,858,533, in addition to 2,144,006 pounds of paraffin wax and candles, valued at $119,520. The oil imports included: crude oil, 120,082,405 gallons, valued at $3,996,842; refined and illuminating oils 14,748,218 gallons, valued at $1,012,735; gasoline 40,904,598 gallons, valued at $5,347,767; lubricating oils 6,762,800 gallons, valued at $1,077,712, and other petroleum products 4,288,463 gallons, valued at $423,477.

The total imports in 1911 were 116,892,689 gallons, valued at $6,009,730, and 1,959,787 pounds of paraffin wax and candles, valued at $106,424. The oil imports included: crude oil 71,653,251 gallons, valued at $2,188,870; refined and illuminating oils, 13,690,962 gallons, valued at $722,403; gasoline 23,338,773 gallons, valued at $1,976,032; lubricating oils 5,308,917 gallons, valued at $806,452, and other petroleum products 2,900,786 gallons, valued at $315,973.

Phosphate.—Shipments of phosphate or apatite in 1912 were 164 tons, valued at $1,640, as compared with 621 tons, valued at $5,206, in 1911. There were no exports in 1912, while exports of 3 tons, valued at $100, were reported in 1911. There was an export of phosphorus in 1912, of 543,620 pounds, valued at $66,806. The imports of phosphate rock (fertilizer) in 1912 were valued at $24,586; phosphorus, 13,807 pounds, valued at $4,012, and manufactured fertilizers valued at $580,351. The imports in 1911 included phosphate rock (fertilizer), valued at $4,217; phosphorus, 14,818 pounds, valued at $4,384 and manufactured fertilizers valued at $386,645.

Pyrites.—The production of pyrites in 1912 was 81,526 tons, valued at $314,085, as compared with 82,666 tons, valued at $365,820, in 1911. The exports of pyrites in 1912 were 5,938 tons, valued at $11,935, as against exports of 32,102 tons, valued at $120,585, in 1911. The imports of brimstone or sulphur in 1912 were 38,647 tons, valued at $806,690, as against 21,931 tons, valued at $446,491, in 1911.

Quartz.—The production of quartz in 1912 was reported as 100,242 tons, valued at $195,216, compared with a production in 1911 of 60,526 tons, valued at $83,865. There were imported during 1912, 629 tons of silex or crystallized quartz, valued at $10,680, and 2,802 tons flint, valued at $39,891; and in 1911, 394 tons of silex, valued at $7,518, and 3,766 tons flint, valued at $49,106.

Salt.—The total sales of salt in 1912 were 95,053 tons, valued at $459,582 (exclusive of packages). The value of the packages used was $224,696. In 1911 the sales were 91,582 tons, valued at $443,004, and value of packages used $198,789.

Exports of salt in 1912 were 289,150 pounds, valued at $3,723, and in 1911, 454,600 pounds, valued at $5,055. The total imports of salt in 1912 were valued at $485,950, and included: 30,067 tons, valued at $133,969, subject to duty; and 109,639 tons, valued at $352,081, duty free. The 1911 imports were valued at

$436,118, and included: 23,176 tons, valued at $109,793, subject to duty; and 101,174 tons, valued at $326,325, duty free.

Among the imports of soda products in 1912 are included: soda ash or barilla, 52,167,811 pounds, valued at $421,959; soda bichromate, 584,424 pounds, valued at $33,744; caustic soda in packages of 25 pounds or more, 14,544,545 pounds, valued at $278,579; sal soda 9,996,562 pounds, valued at $64,020; nitrate of, 83,989,303 pounds, valued at $1,537,379, and sulphate of soda, 19,243,823 pounds, valued at $97,768.

Talc.—The production of talc in 1912 was 8,270 tons, valued at $23,132, as against 7,300 tons, valued at $22,100. Imports of talc for the calendar year 1912 were 195 tons, valued at $4,414.

Tripolite.—Thirty-eight tons of tripolite, valued at $230, were shipped in 1912, and 20 tons, valued at $122, in 1911.

STRUCTURAL MATERIALS AND CLAY PRODUCTS.

Cement.—The total sales of cement in 1912 were 7,132,732 barrels, valued at $9,106,556, as against 5,692,915 barrels, valued at $7,644,537, sold in 1911, showing an increase of 1,439,817 barrels. The exports of cement in 1912 were valued at $2,436, as compared with exports valued at $4,067 in 1911.

The imports of cement in 1912 included: manufactures of cement valued at $9,698; and Portland cement 5,020,446 hundredweight (1,434,413 barrels), valued at $1,969,529. The imports in 1911 were: manufactures of cement, valued at $7,430; hydraulic cement 26,655 hundredweight, valued at $6,107; and Portland cement 2,316,707 hundredweight (661,916 barrels), valued at $834,879. The consumption of Portland cement in Canada in 1912 was approximately 8,567,145 barrels, as compared with 6,354,831 barrels in 1911.

Clay Products.—The total value of the production of clay products in Canada in 1912 was $10,575,709, as compared with a total value of $8,359,933 in 1911. Brick and tile products alone were valued in 1912 at $9,072,675, as against $6,946,009 in 1911. The value of sewerpipe production in 1912 was $884,641, as compared with $812,716 in 1911. The only clay products exported in 1912 were 694,000 building brick, valued at $8,493, and manufactures of clay valued at $256; against 394,000 building brick, valued at $3,977, and manufactures of clay valued at $2,071. The total imports of clay products in 1912 were valued at $6,592,540, and included: brick and tile valued at $3,209,190; earthenware and chinaware $3,094,956, and clays valued at $288,394. The total imports in 1911 were valued at $5,156,544, and included: brick and tile valued at $2,369,761; earthenware and chinaware $2,516,536, and clays valued at $270,247.

Kaolin.—In 1912 [illegible]ment of 20 tons valued at $160 was reported.

Lime.—The total production of lime in 1912 was 8,475,839 bushels, valued at $1,844,849, as compared with 7,533,525 bushels, valued at $1,517,756, in 1911. The exports of lime in 1912 were valued at $35,097, as against exports valued at $39,536 in 1911. The imports of lime in 1912 were 329,925 barrels, valued at $207,481, and in 1911, 228,538 barrels, valued at $161,985.

Sand-Lime Brick.—The total sales of sand-lime brick in 1912 by 20 firms reporting were 96,448,462, valued at $1,020,386, an average value of $10.58 per thousand. The sales in 1911 by 16 firms reporting were 51,535,243 brick, valued at $442,427, an average value of $8.58 per thousand.

Slate.—The production of slate in 1912 was 1,894 squares, valued at $8,939, and 1,833 squares, valued at $8,248, in 1911.

The imports of slate in 1912 were valued at $200,643, and included: roofing slate valued at $88,911; school writing slate, $39,858; slate pencils, $6,978, and manufactures of slate, $65,896. The imports in 1911 were valued at $169,685, and included: roofing slate valued at $83,075; school writing slate, $35,049; slate pencils, $6,036, and manufactures of slate, $4[illegible]525.

Stone.—The total value of the production of stone of all kinds in 1912 was $4,726,171, as compared with a value of $4,328,757 in 1911. The value of stone exports in 1912 was $33,242, as against $28,335 in 1911; and the total value of stone imported in 1912 was $1,467,143, as against imports valued at $1,140,846 in 1911.

The production in 1912 included: granite, valued at $1,373,119; limestone, $2,762,936; marble, $260,764, and sandstone, $329,352. In 1911 the production of granite was valued at $1,119,865, limestone, $2,594,926; marble, $162,783, and sandstone, $451,183.

PRODUCTION BY PROVINCES.

A summary of the mineral production by provinces in 1911 and 1912 is shown in the accompanying tables, in the first of which the total production in the several provinces, and the percentage of each, are given for the past three years. This record shows some slight changes in the relative importance of the production of each. The only change in the order of magnitude of output is that Alberta, the production of which had exceeded that of Quebec in 1910, but fallen below in 1911, on account of its restricted coal output, again takes premier place in 1912. Ontario is still the largest contributor to the total, being credited with 38·5 per cent, or $51,985,876; British Columbia comes second with 22 per cent, or $30,076,635; Nova Scotia third with $18,922,236, or 14 per cent; Alberta fourth with $12,073,589, or nearly 9 per cent; and Quebec fifth with $11,656,998, or 8·6 per cent. Manitoba, Saskatchewan, and New Brunswick, follow in the order named.

It should be remembered in dealing with these comparisons that Nova Scotia in the above record is given no credit on account of the large iron smelting and

steel making industries at Sydney, New Glasgow, etc. The pig iron made here is entirely from imported ore and naturally is not credited as a Canadian mine output. The same remark applies to a large percentage of the pig iron production in Ontario, as well as to the production of aluminium in Quebec.

There was an increased output in each of the provinces in 1913, the largest gains being in Alberta and British Columbia.

In Nova Scotia both coal and gypsum mining were particularly active, though a reduced production of gold is reported. Copper and asbestos mining in Quebec contribute chiefly to the increase in that Province. Ontario had important increases in nickel and copper, but more especially in gold from the Porcupine district. This Province has a large output of non-metallic products, including cement, clays, etc. In Alberta coal mining has had a record year, exceeding in tonnage the British Columbia production. In the latter Province the principal increase was in copper, with gold, silver, lead, zinc, coal, and structural or building materials as important contributors.

The last table shows the total mineral production of Canada by provinces for the years 1889 to 1912 inclusive.

Mineral Production by Provinces, 1910, 1911, and 1912.

Province.	1910.		1911.		1912.	
	Value of production.	Per cent of total.	Value of production.	Per cent of total.	Value of production.	Per cent of total.
	$	%	$	%	$	%
*Nova Scotia	14,195,730	13·29	15,409,397	14·93	18,922,236	14·01
New Brunswick	581,942	0·54	612,830	0·59	771,004	0·57
Quebec	8,270,136	7·74	9,304,717	9·01	11,656,998	8·63
Ontario	43,538,078	40·76	42,796,162	41·46	51,985,876	38·50
Manitoba	1,500,359	1·40	1,791,772	1·74	2,463,074	1·83
Saskatchewan	498,122	0·47	636,706	0·62	1,165,642	0·86
Alberta	8,996,210	8·42	6,662,673	6·46	12,073,589	8·94
British Columbia	24,478,572	22·92	21,299,305	20·63	30,076,635	22·27
Yukon	4,764,474	4·46	4,707,432	4·56	5,933,242	4·39
Dominion	106,823,623	100·00	103,220,994	100·00	135,648,296	100·00

* Includes a small production of lime from Prince Edward Island

Mineral Production of Nova Scotia, 1911 and 1912.

Product.	1911.		1912.	
	Quantity.	Value.	Quantity.	Value.
		$		$
Gold ... Ozs.	7,781	160,854	4,385	90,638
Iron ore sold for export ... Tons.	22	50	30,857	168,877
Barytes ... "	50	400	464	5,104
Coal ... "	7,004,420	14,071,379	7,783,888	17,374,750
Grindstones ... "	380	3,382	374	3,760
Gypsum ... "	353,999	406,457	376,082	481,493
Manganese ... "	54	300	75	1,875
Tripolite ... "	20	122	38	230
Clay products ...	...	274,249	...	272,063
Lime ... Bus.	639,200	130,555	709,596	145,121
Stone ...	...	392,914	...	324,630
Other products ...	...	68,735	...	53,705
Total ...	...	15,409,397	...	18,922,236

* The total production of pig iron in Nova Scotia in 1912 was 424,994 tons valued at $6,374,910, and in 1911, 390,242 tons valued at $4,682,904, all produced from imported ore.

Mineral Production of New Brunswick, 1911 and 1912.

Product.	1911.		1912.	
	Quantity.	Value.	Quantity.	Value.
		$		$
Iron ore sold for export ... Tons.	31,120	69,464	71,520	127,716
Coal ... "	55,781	111,562	44,780	89,560
Grindstones ... "	4,186	49,560	4,038	48,330
Gypsum ... "	93,205	115,044	82,757	185,821
Mineral water ...	...	19,843	...	...
Natural gas ... M cub. ft.	...	...	173,903	36,549
Petroleum ... Bls.	2,461	3,019	2,679	3,799
Clay products ...	...	38,000	...	54,910
Lime ... Bus.	613,728	132,897	616,835	133,742
Stone ...	...	73,441	...	90,577
Total ...	...	612,830	...	771,004

Mineral Production of Quebec, 1911 and 1912.

Product.		1911.		1912.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Copper	Lbs.	2,436,190	301,503	3,282,210	536,346
Gold	Ozs.	613	12,672	642	13,270
Iron ore sold for export	Tons.	3,616	6,479	1,185	4,232
Iron, pig from Canadian ore (a)	"	379	9,949	.....	.....
Silver	Ozs.	18,435	9,827	9,465	5,758
Asbestos and asbestic	Tons.	127,414	2,943,108	136,301	3,127,279
Chromite	"	157	2,587	.....	.....
Feldspar	"	17	255	100	2,000
Graphite	"	374	33,084	604	50,680
Magnesite	"	991	5,531	1,714	9,645
Mica	"	.....	69,465	.....	81,044
Mineral water	Gals.	.....	63,637	92,873	36,736
Ochres, iron oxides	Tons.	3,612	28,173	7,654	32,410
Peat	"	200	800	500	2,000
Phosphate	"	586	4,909	164	1,640
Pyrites	"	39,122	247,555	60,849	243,396
Quartz	"	548	684	556	1,240
Cement	Bls.	1,614,730	1,963,139	2,714,685	3,134,499
Clay products		.....	1,341,467	.....	1,680,300
Kaolin	Tons.	.....	.....	20	160
Lime	Bus.	1,428,392	356,453	1,729,614	474,595
Slate	Squares.	1,833	8,248	1,894	8,939
Stone		.....	1,894,892	.....	1,957,703
Other products		.....	.....	.....	243,126
Total		.....	9,304,717	.....	11,656,998

(a) The total production of pig iron in Quebec in 1911 was 658 tons valued at $17,282, while there was none whatever in 1912.

There was also in this Province an important production of aluminium from imported ores.

Mineral Production of Ontario, 1911 and 1912.

Products.		1911.		1912.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Cobalt oxide and nickel oxide	Lbs.	154,174		349,054	156,256
Cobalt mineral and mixed cobalt and nickel oxide	"		221,690		
Copper	"	1,260,832		1,285,280	163,988
Gold	Ozs.	17,932,233	2,219,397	22,250,601	3,635,971
Iron ore, sold for export	Tons.	2,032	12,625	86,523	1,788,596
Iron pig from Canadian ore *(a)*	"	5,379	12,577	14,567	28,125
Nickel	Lbs.	41,807	603,455	36,355	450,889
Silver	Ozs.	34,098,744	10,229,623	44,841,542	13,452,463
Zinc ore	Tons.	30,540,754	16,279,443	29,214,025	17,772,352
Actinolite	"			10	3,750
Arsenious oxide	"	67	736	92	1,000
Corundum	"	2,097	76,237	2,045	89,262
Feldspar	"	1,472	161,873	1,960	239,091
Fluorspar	"	17,706	51,684	13,633	28,916
Graphite	"	34	238	40	240
Gypsum	"	895	36,492	1,456	66,442
Mica	"	27,399	98,018	53,119	176,056
Mineral water			59,212		62,932
Natural gas	M cub. ft.	10,863,871	136,778		131,529
Ochres	Tons.	10	1,807,513	12,529,463	2,036,245
Peat	"	1,263	160		
Petroleum	Bls.	288,631	3,017	200	900
Phosphate	Tons.	35	354,054	240,657	341,251
Pyrites	"	43,544	297		
Quartz	"	59,978	118,265	20,677	70,689
Salt	"	91,582	83,181	99,686	193,976
Talc	"	7,300	443,004	95,053	459,582
Cement	Bls.	3,099,786	22,100	8,270	23,132
Clay products			3,741,039	3,044,713	3,372,897
Lime	Bus.	3,360,265	3,916,575		4,864,700
Sand-lime brick	No.	29,502,186	538,902	3,376,193	573,269
Stone			237,662	36,371,002	328,548
Other products			892,305		1,109,164
			408,110		363,668
Total			42,796,162		51,985,876

(a) The total production of pig iron in Ontario in 1912 was 589,593 tons, valued at $8,176,089; in 1911, 526,635 tons, valued at $7,606,939.

Mineral Production of Manitoba, 1911 and 1912.

Product.		1911.		1912.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Calcined gypsum	Tons.	43,000	372,000	60,500	481,250
Clay products			831,428		1,018,051
Lime	Bus.	706,888	140,629	818,237	168,257
Cement	Bls.	21,350	28,280	12,127	16,068
Sand-lime brick	No.	9,679,985	98,370	27,594,874	294,700
Stone			318,050		383,695
Other products					101,653
Total			1,791,772		2,463,974

Mineral Production of Saskatchewan, 1911 and 1912.

Product.		1911.		1912.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Coal	Tons.	206,779	347,248	225,342	368,135
Brick, common and pressed	No.	21,071,660	224,758	30,538,771	332,943
Lime	Bus.			4,000	1,440
Sand-lime brick	No.	(a)		16,292,114	207,671
Other products			64,700		255,453
Total			636,706		1,165,642

(a) In 1911, included in "Other products."

Mineral Production of Alberta, 1911 and 1912.

Product.		1911.		1912.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Gold	Ozs.	10	207	73	1,509
Coal	Tons.	1,511,036	3,979,264	3,240,577	8,113,525
Natural gas	M ft.	780,286	110,165	2,583,437	289,906
Cement	Bls.	512,176	1,241,535	821,165	1,775,898
Clay products			1,052,751		1,356,184
Lime	Bus	434,038	100,407	704,035	166,520
Sand-lime brick	No.	3,500,000	20,000	10,732,000	139,952
Sandstone			158,344		81,391
Other products					148,704
Total			6,662,673		12,073,589

Mineral Production of British Columbia, 1911 and 1912.

Product.		1911.		1912.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Copper (a)	Lbs.	35,279,536	4,380,198	50,526,656	8,294,561
Gold	Ozs.	238,486	4,930,145	251,815	5,205,485
Lead	Lbs.	23,784,969	827,717	37,763,476	1,507,554
Silver	Ozs.	1,887,147	1,005,924	2,651,002	1,612,737
Zinc ore	"	2,580	101,072	6,405	211,309
Coal	Tons.	2,542,532	7,945,413	3,208,997	10,028,116
Gypsum	"	780	1,875	.....	.....
Mineral water	Bls.	401,000	3,500	.....	4,200
Cement	.....	.....	601,500	511,539	767,038
Clay products	.....	.....	675,505	.....	996,508
Lime	Bus.	351,014	117,756	517,329	181,905
Sand-lime brick	No.	2,953,072	23,889	5,458,412	49,515
Stone	.....	.....	698,811	.....	779,611
Other products	.....	.....	.....	.....	385,946
Total	.....	.....	21,209,305	.....	30,076,635

(a) Smelter recoveries of copper.

Mineral Production of Yukon, 1911 and 1912.

Product.		1911.		1912.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Copper	Lbs.	.....	.....	1,772,660	289,670
Gold	Ozs.	224,197	4,634,574	268,447	5,549,296
Silver	"	112,708	60,078	81,068	49,318
Coal	Tons.	2,840	12,780	9,245	44,958
Total	.....	.....	4,707,432	.....	5,933,242

Mineral Production by Provinces, 1899-1912.

Calendar Year.	Nova Scotia.*	New Brunswick.	Quebec.	Ontario.	Manitoba.	Alberta.	Saskatchewan.	Yukon.	British Columbia.	Total.
	$	$	$	$	$	$	$	$	$	$
1899	6,817,274	420,227	2,585,635	9,819,557						
1900	9,298,479	439,060	3,292,383	11,258,089						
1901	7,770,159	467,985	3,759,984	13,970,010						
1902	10,686,549	607,129	3,743,636	14,619,091						
1903	11,431,914	580,495	3,585,938	14,160,033						
1904	11,212,746	559,913	3,698,482	12,582,843						
1905	11,507,047	558,035	4,405,975	18,833,292						
1906	12,894,303	646,328	5,242,058	25,111,682						
1907	14,532,040	664,647	6,205,553	30,381,638	898,775	4,657,524	833,251	3,335,886	25,636,056	86,865,392
1908	14,487,108	579,816	6,372,949	30,623,812	584,374	5,122,505	413,212	3,669,290	23,704,035	85,557,101
1909	12,504,810	657,035	7,086,235	37,374,577	1,193,377	6,047,447	456,246	4,032,673	22,479,066	91,831,441
1910	14,195,730	581,942	8,270,136	43,538,078	1,500,350	8,996,210	498,122	4,764,474	24,478,572	106,823,623
1911	15,109,397	612,890	9,304,717	42,796,162	1,791,772	6,662,673	636,706	4,707,432	21,299,305	103,221,994
1912	18,922,236	771,004	11,656,998	51,985,876	2,463,074	12,073,589	1,165,642	5,933,242	30,076,635	135,048,296

* Includes a small production of lime from Prince Edward Island.

MINE PRODUCTION.

The statistics of metalliferous production published in the tables preceding show in most cases the quantities of metals recovered or probably recoverable.

A general consideration of mine operations from the viewpoint of the actual tonnage of ore mined, the quantities concentrated, and the tonnage shipped to smelters is also of much interest.

The Mines Branch has been endeavouring to obtain from every mine operator in Canada an annual return with respect to:—

(1) The number of men employed and wages paid.

(2) The total tonnage of ores mined, the tonnage concentrated, and the quantities of concentrates produced.

(3) The tonnage of ores or concentrates shipped and the net value thereof.

(4) The quantities of metals as determined by settlement assays contained in the ores shipped, and the quantities of metals for which payment was made by the purchasing smelter or recovered by the operators' smelter.

There are unfortunately two industries in which it has not as yet been feasible to obtain a complete record. These are the production of placer gold on the one hand and of petroleum on the other. In both cases, while a record of production is available, there is no record as to the number of men employed or the amount paid in wages. With respect to the other industries, while it has not been possible to obtain returns from every mine operator, the missing returns usually represent comparatively small productions, and sufficient information is available to give a fairly close estimate of results.

The metalliferous ores mined in Canada at present fall naturally into a number of more or less broad groups as follows:—

(1) Iron ores.

(2) Milling gold ores, including certain dry ores shipped to smelters.

(3) Silver and silver cobalt nickel ores of Ontario

(4) Nickel copper ores of Ontario.

(5) Silver lead and zinc ores.

(6) Copper-gold-silver ores (chiefly of British Columbia).

Statistics covering the years 1910, 1911, and 1912 are shown in tabular form herewith. Excluding placer and hydraulic gold workings the number of metalliferous mines shipping in 1912 was 163, as compared with 160 reported in 1911; the number of men employed in 1912 was 10,612 as against 9,622; wages paid $10,113,578 compared with $7,857,580 in 1911; tons of ore mined 4,194,517 in 1912 as against 3,195,330 tons the previous year; tons of ore, concentrates, or metal shipped, 3,360,432 in 1912 and 2,431,188 in 1911; total net value of shipments including placer gold $46,018,233 in 1912 and $34,760,513 in 1911.

In non-metalliferous mining, exclusive of stone quarries and clay pits, there were employed in 1912 an average of 33,954 men earning in wages $23,877,781.

The tonnage mined, chiefly coal, was 17,165,628 and tons shipped 15,548,981 having a net value of $45,080,674. There were employed in this class of mining in 1911 an average of 32,126 men, earning in wages $18,469,420; the number of tons mined was 13,890,468; tons shipped 12,247,348, having a net value of $34,405,960. The manufacture of cement, clay products, and lime, and the quarrying of stone, etc., employed in 1912 an average of 22,168 men, to whom were paid in wages $11,511,120, and the net value of products shipped was $28,794,869. These operations in 1911 engaged an average of 19,004 men, earning $8,827,508 in wages, and the value of products shipped was $22,709,611. Excluding the labour employed in placer gold mining and in the production of petroleum for which, as already explained, no record has been obtained, the total number of men engaged in the mining industry in 1912 was about 66,734 and wages paid $45,502,479. In 1911 the number of men was 60,752 and wages $35,154,508. It should be remembered that this is a record only of shipping mines and does not include the labour employed in prospecting or in developing new properties, neither does it include any record of labour employed in the smelting and refining of ores, or in blast furnace operations.

The total net value of mine shipments and the products of cement, clay, and lime plants on the basis shown in these tables was $119,893,776 in 1912, as compared with $91,876,084 in 1911.

This value it will be observed is considerably less than that shown in the Table of Mineral Production given on page 6, the difference being due entirely to the fact that values accrued through metallurgical reduction and refining are not included in these tables, they being intended to present, as indicated in the title, mine products. The values given in these tables are in general those furnished by the operators. In certain cases where mining, smelting, and refining operations are carried on by the same operator, it becomes a matter of no small difficulty to satisfactorily subdivide profits among the various operations, particularly when there is no general market for the class of ores treated. The nickel copper ores of the Sudbury district may be cited as a typical example. The value of $4 a ton placed upon this ore very probably does not include a sufficient proportion of the profits obtained in the ultimate refining.

Mine Production 1910.

	No. of mines or works.	Men employed.		Wages Paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground.	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	8	971		443,998	335,768	259,418	574,362
Milling gold ores—							
Bullion shipped.							659,987
Concentrate	47	969		725,989	138,021	8,997	565,340
Silver-cobalt ores—							
Mine bullion shipped						35	542,034
Ore and concentrate	38	1,632	1,322	2,642,133	274,780	35,627	15,344,470
Nickel-copper ores	7	669	286	719,237	652,392	652,392	2,609,568
Copper ores	3	118	97	105,366	54,220	36,714	172,162
Silver-lead and zinc ores	48	592	282	850,416	180,070	58,418	1,668,415
Copper-gold-silver ores	19	1,432	487	1,872,242	1,958,591	1,924,405	7,888,306
Shipping mines not reporting:							
Silver-lead	12						
Copper-gold	9				1,994	1,994	
Placer mining—							
Yukon							4,550,000
British Columbia							540,000
Other provinces							1,850
Total metallic	191	8,839		7,359,381	3,595,836	2,978,000	35,116,194
Total non-metallic		36,210		22,698,000	16,148,993	13,800,989	37,757,158
Total structural material		17,259		7,547,000			19,627,592
Total		62,308		37,604,381			92,501,244

Mine Production 1911.

—	No. of mines or works.	Men employed.		Wages Paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground.	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	8	943		449,468	421,113	210,344	522,319
Milling gold ores—							
Bullion shipped							513,991
Concentrates	45	1,085		954,659	118,758	8,026	663,213
Silver-cobalt ores—							
Mine bullion shipped						130	2,007,440
Ore and concentrate	36	1,794	1,448	2,722,228	254,290	25,539	14,400,245
Nickel-copper ores	7	858	425	889,894	612,511	612,511	2,450,044
Copper ores	2	119	67	98,684	66,088	39,047	247,555
Silver-lead and zinc ores	40	528	297	809,862	120,323	48,660	1,186,996
Gold-copper-silver ores	22	1,495	563	1,933,385	1,602,247	1,486,931	7,727,696
Placer mining—							
Yukon							4,606,812
British Columbia							426,000
Other provinces							8,202
Total metalliferous	160	9,622		7,857,580	3,195,330	2,431,188	34,760,513
" non-metalliferous		32,126		18,469,420	13,890,468	12,247,348	34,405,960
" structural materials		19,004		8,827,508			22,709,611
		60,752		35,154,508			91,876,084

Mine Production 1912.

—	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals, shipped.	Net value of shipments.
		Underground.	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons	$
Iron ores	8	524		371,938	171,792	215,883	523,315
Milling gold ore—							
Bullion shipped	43						
Concentrates				1,551,006	296,297	6,114	669,727
Silver-cobalt ores—							
Mine bullion shipped	31					164	2,899,360
Ore and concentrate		1,635	1,448	3,107,286	319,348	29,106	14,592,559
Nickel-copper ores	8	970	830	1,404,652	737,726	737,726	2,953,306
Copper ores	3	154	95	160,765	64,952	60,869	508,993
Silver-lead and zinc ores	50	597	331	1,002,203	202,343	66,377	2,767,741
Gold-copper-silver ores	20	1,434	873	2,515,728	2,408,059	2,244,193	13,113,144
Placer mining—							
Yukon							5,540,000
British Columbia							555,500
Other provinces							11,379
Total metalliferous	163	10,612		10,113,578	4,194,517	3,360,432	46,018,239
" non-metalliferous	443	33,954		23,877,781	7,165,628	15,548,981	45,080,674
" structural materials	831	22,168		11,511,120			28,794,869
	1,437	66,734		45,502,479			119,893,776

Labour and Wages Statistics Covering Non-Metalliferous Mines During 1911 and 1912.

	1911.			1912.		
	No. active mines or works.	No. employed.	Wages paid.	No. active mines or works.	No. employed.	Wages paid.
NON-METALLIC.			$			$
Asbestos and asbestic	12	2,707	1,231,896	10	2,955	1,401,653
Coal	195	26,141	15,695,735	244	27,581	20,784,843
Feldspar	6	78	29,918	4	80	31,487
Graphite	7	302	106,000	7	221	86,831
Grindstones, pulpstones, scythestones	6	134	29,300	6	149	35,057
Gypsum	19	1,233	517,800	19	1,381	579,952
Mica and phosphates	30	231	73,870	26	241	96,415
Mineral pigments, barytes, and ochres	5	82	25,568	4	65	21,270
Mineral water	17	102	37,963	14	90	34,550
Natural gas	40	276	263,098	76	433	302,012
Peat	3	16	2,800	3	27	4,450
Pyrites	6	162	112,294	4	115	110,888
Quartz	8	145	52,543	7	128	80,340
Salt	12	225	123,040	12	231	155,648
Others ‡	9	292	167,595	8	292	168,641
Total non-metallic	375	32,126	18,469,420	443	33,954	23,877,781
STRUCTURAL.						
Cement	24	3,010	[illegible]	26	3,461	2,623,902
Clay products	419	9,131	3,524,058	460	10,450	4,504,213
Lime	75	1,056	523,518	78	1,103	576,217
Sand-lime brick	16	337	166,902	20	544	349,192
Sand and gravel (a)	.....	No record	.....	54	875	527,425
Slate	1	33	9,187	1	25	12,055
Stone	191	5,437	2,500,005	192	5,710	2,918,116
Total structural	726	19,004	8,827,508	831	22,168	11,511,120
" non-metalliferous	1,101	51,130	27,296,928	1,274	56,122	35,388,901

‡ Includes: actinolite, chromite, corundum, fluorspar, magnesite, manganese, talc, and tripolite.
(a) No record in 1911. Partial record only in 1912.

SMELTER PRODUCTION.

Statistics of the production of copper, lead, and silver smelters and refineries showing the tonnage of ore treated, the matte, blister, base bullion, or refined metal produced, etc., were collected for the first time by the Mines Branch in 1908 and were published in the report for that year. Similar returns covering each succeeding year have also been received through the courtesy of the various operating companies, a list of which follows:—

[1] The Canadian Antimony Co., St. George, N.B.
The Mond Nickel Co., Victoria Mines, Ont.
The Canadian Copper Co., Copper Cliff, Ont.
The Coniagas Reduction Co., Thorold, Ont.
The Deloro Mining and Reduction Co., Deloro, Ont.
The Canada Refining & Smelting Co., Ltd., Orillia, Ont.
The North American Smelting Co., Kingston, Ont.
The Consolidated Mining and Smelting Co. of Canada, Ltd., Trail, B.C.
The Granby Consolidated Mining, Smelting, and Power Co., Grand Forks, B.C.
The British Columbia Copper Co., Ltd., Greenwood, B.C.
[1] The Tyee Copper Co., Ltd., Ladysmith, B.C.

The aggregate quantities of ores and concentrates treated in these works during 1912 were 3,005,410 tons, as compared with 2,193,553 tons in 1911, an increase of about 37 per cent. The largest proportion of the total tonnage (over 70 per cent) consists of the copper-gold-silver ores of British Columbia, chiefly from the Boundary (Phoenix and Greenwood), Rossland, and Coast (Britannia and Texada island) districts. The nickel-copper ores of the Sudbury district, Ontario, contributed about 24 per cent of the tonnage, the balance being lead ores of British Columbia and silver cobalt ores of Ontario.

The quantities of these several classes of ores smelted during the past five years have been as follows:—

Year.	Nickel-copper ores.	Silver-cobalt ores.	Lead ores.	Copper-gold-silver ores.	Totals.
1908	360,180	7,182	53,455	1,797,488	2,218,395
1909	462,336	8,384	54,539	1,850,889	2,376,148
1910	628,947	9,466	57,549	1,987,752	2,683,714
1911	610,834	9,330	55,408	1,517,981	2,193,553
1912	725,065	8,097	59,932	2,212,316	3,005,410

The products obtained in Canada from the treatment of these ores include: pig lead produced at Kingston, Ont., refined pig lead and lead pipe produced at Trail, B.C ; and fine gold, fine silver, copper sulphate, and antimony produced

[1] Not in operation during 1912.

from the residues of the Trail lead refinery; silver bullion, white arsenic, nickel oxide, and cobalt oxide produced in Ontario, from the Cobalt District ores. Refined antimony was produced in New Brunswick in 1909. In addition to these refined products, blister copper, copper matte, nickel-copper matte, cobalt material or mixed nickel and cobalt oxides are produced and exported for refining outside of Canada.

The aggregate results of smelting and refining operations may be summarized as shown in the next table. Unfortunately the figures cannot be taken to represent the total production from smelting ores mined in Canada, since considerable quantities of copper and silver ores are still shipped to other smelters outside of Canada for smelting.

It should also be explained that the figures include the results of the treatment in British Columbia of a small quantity of imported ores.

Smelter and Refinery Production in Canada.

Matte, blister copper, and other smelter products obtained and exported for refining.	1908.	1909.	1910.	1911.	1912.
	Tons	Tons.	Tons.	Tons.	Tons.
(1) Blister copper	15,418	14,239	13,918	10,710	17,063
(2) Copper matte	7,649	11,597	11,519	11,320	6,727
(3) Nickel-copper matte	21,210	25,845	33,033	32,607	41,925
(4) Lead bullion		2,010			
(5) Cobalt material			54	630	642

Refined products produced and metals contained in unrefined smelter products exported.		1910.		1911.		1912.	
		Refined products.	Metals contained in matte, blister, base bullion, and speiss.	Refined products.	Metals contained in matte, blister, and base bullion.	Refined products.	Metals contained in matte, blister, and base bullion.
Antimony	Lbs.						
Gold	Ozs.	13,298	197,181	15,270	175,189	12,118	184,815
Silver	"	16,373,799	2,136,414	19,078,768	585,896	17,572,217	686,171
Lead	Lbs.	32,987,508		23,525,050		35,893,190	
Copper	"		56,149,299		29,855,868		58,405,910
Copper sulphate	"	163,228		197,187		87,110	
Nickel	"		37,587,676		34,098,744		44,841,542
Cobalt oxide and nickel oxide	"	13,508		154,174		349,054	
White arsenic	"	3,003,467		4,194,209		4,090,768	
Arsenic	"						

(1) Blister copper carrying gold and silver values.
(2) Copper matte " " "
(3) Bessemer nickel-copper carrying small gold and silver values as well as metals, of the platinum group.
(4) Unrefined lead bullion carrying silver values.
(5) Cobalt material carrying nickel and silver values.

Nickel-Copper Ores.—These ores in the Sudbury district, together with a small tonnage from the Alexo mine in the district of Nipissing, Ontario, are treated in the smelters of the Canadian Copper Co., at Copper Cliff, and The Mond Nickel Company at Victoria Mines. The new smelter being constructed by the latter Company at Coniston was not in commission during 1912. A large portion of the ore is roasted in open heaps, before smelting.

The total quantity of ore mined during 1912 was 737,726 tons, and the quantity smelted was 725,065 tons. There was produced 41,925 tons of Bessemer matte containing 11,116 tons of copper and 22,421 tons of nickel. This is the largest production since the beginning of operations in 1886. In 1911 there was smelted 610,834 tons of ore, from which was produced 32,607 tons of Bessemer matte, containing 8,966 tons of copper and 17,049 tons of nickel.

Statistics of smelter production from these ores which are available since the commencement of this industry are shown in the following table:—

Smelter Production of the Nickel-Copper Ores of the Sudbury District.

Calendar Year.	Ore mined.	Ore smelted.	Matte shipped.	Value matte.	Nickel content of matte.	Copper content of matte.
	Tons.	Tons.	Tons.	$	Tons.	Tons.
1886	3,307					
1887	567	30,000			900	1,500
1888						
1889	44,990	40,146	3,274		432	733
1890					718	651
1891	83,300	72,558	10,336		2,018	2,064
1892	74,381	57,022			1,207	1,102
1893			9,425		1,991	1,821
1894	103,223	96,038	11,681	766,422	2,454	2,604
1895	74,135	68,618	10,188	890,834	1,944	2,288
1896	94,966	71,027	10,759	416,594	1,699	1,584
1897	93,154	96,370	13,968		1,999	2,750
1898	123,820	121,924			2,759	4,187
1899	159,957	172,761		702,341	2,872	2,834
1900	196,420		23,336	1,076,306	3,540	3,364
1901	315,692	255,958		1,661,839	4,594	4,318
1902	269,538	211,847	25,311	1,327,448	5,347	3,553
1903	136,033	207,030	13,832	2,686,469	6,253	3,576
1904	203,388	118,470	10,154	2,193,198	5,274	2,455
1905	277,766	251,421	17,405	4,019,814	9,438	4,386
1906	343,814	340,059	20,310	4,628,011	10,745	5,264
1907	351,916	359,076	22,025	3,289,382	10,595	6,996
1908	409,551	360,180	21,210	2,930,989	9,572	7,503
1909	451,892	462,336	25,845	1,913,012	13,141	7,879
1910	652,392	628,947	35,033	5,380,064	18,636	9,630
1911	612,511	610,834	32,607	4,945,593	17,049	8,966
1912	737,726	725,065	41,925	6,303,102	22,421	11,116

Silver-Copper-Nickel-Arsenic Ores.—The first shipments of silver ores were made from the Cobalt district in 1904, and in 1906 the first works for the treatment of these ores in Canada were established by the Canadian Copper Co., at Copper Cliff, Ont. Subsequently plants were erected by the Coniagas Reduction Company at Thorold, the Deloro Mining and Reduction Co. at Deloro, and the

Canada Refining and Smelting Company at Orillia, at each of which nickel and cobalt oxides are recovered in addition to silver bullion and white arsenic. Other small plants have more recently been established at Kingston, North Bay, and Trout Lake.

A large proportion of the ore tonnage shipped from this district is still sent to smelters in the United States, although during the past two years there has been a growing tendency toward the treatment of these ores by cyanidation and the recovery of silver at the mine in the form of bullion. Thus we find a falling off, during 1912, in the production of silver at Canadian smelters and an increased amount of bullion produced at the mines.

The treatment of these ores in Ontario during the past four years has given the following results:—

		1909.	1910.	1911.	1912.
Ore treated	Tons.	8,384	9,466	9,330	8,097
Products recovered—					
Silver produced†	Ozs.	12,239,542	14,574,839	17,753,167	15,675,218
White arsenic	Lbs.	2,258,087	3,003,467	4,194,209	4,090,768
Speiss or residues	Tons.	2,660	3,074	.....	.....
Cobalt oxide and nickel oxide	Lbs.	.....	13,508	154,174	349,054
Mixed cobalt and nickel oxides and cobalt material	"	.....	108,178	1,260,832	1,285,280

† Fine ounces contained in silver bullion, fineness ranging from 850 to 998.

Lead Ores.—There were two lead smelting plants in operation in Canada in 1912, a small plant having been constructed at Kingston, Ontario, for the smelting of ores of the Frontenac and other lead mines in Ontario. During 1912 this furnace was blown in on British Columbian and imported ores and lead waste. The smelter at Trail, B.C., treated practically all of the lead ore mined in southern British Columbia, with the exception of a small tonnage that went to Kingston.

In the lead refinery at Trail, the bullion from the smelter is cast into anodes and re-deposited electrolytically upon cathode sheets of refined lead. The refined lead is cast into pigs or manufactured into lead pipe. The slimes from the tank room carry gold, silver, antimony, arsenic, and copper. The first two are recovered as fine metals, and the copper as copper sulphate. Antimony is also recovered, though not regularly, and bearing metal is manufactured.

The annual production of refined lead, fine gold and silver, and copper sulphate has been as follows:—

Calendar Year.	Refined lead	Fine gold.	Fine silver.	Copper sulphate.
	Lbs.	Ozs.	Ozs.	Lbs.
1904	7,519,440	4,336	551,450	56,000
1905	15,804,509	8,602	1,088,328	77,175
1906	20,471,314	9,993	1,263,809	143,135
1907	26,607,461	10,395	1,631,422	97,751
1908	36,549,274	15,346	1,956,039	203,379
1909	41,883,614	18,241	2,003,003	51,405
1910	32,987,508	13,298	1,798,960	163,228
1911	23,525,050	15,270	1,325,601	197,187
1912	35,254,790	12,118	1,899,999	87,110

Gold-Silver Copper Ores of British Columbia.—Of the four copper smelters in British Columbia, three were active during 1912. These were the Trail copper furnace of the Consolidated Mining and Smelting Company, treating the ores of the Rossland camp and other ores of the district; the Grand Forks plant of the Granby Consolidated Mining, Smelting, and Power Co., and the Greenwood plant of the British Columbia Copper Company, treating chiefly the low grade ores of the Boundary district.

On the coast the Tyee Copper Company's furnace at Ladysmith was idle throughout the year. A new smelter is being constructed at Anyox, Observatory inlet, Portland canal, by the Granby Company, to treat the ores of the Hidden Creek mines. It is expected that this smelter will be completed and in operation during 1913.

The aggregate production of British Columbia copper smelters during the past four years, including the foreign ores treated, was as follows:—

		1909.	1910.	1911.	1912.
Ore smelted	Tons.	1,850,889	1,987,752	1,517,981	2,212,316
Smelter products—					
Matte	"	11,597	11,519	11,320	6,727
Blister	"	14,239	13,918	10,710	17,069
Metallic content of matte and blister—					
Gold	Ozs.	198,898	197,181	175,189	184,815
Silver	"	612,164	636,140	585,896	686,171
Copper	Lbs.	37,581,884	36,890,283	29,855,868	36,174,185

Trail Smelter.—Statistics of the production of the Trail smelter, including both the copper and lead furnaces, have been published in the annual reports of the Company, the figures since 1906 having been as follows:—

Production of Trail Smelter.

Year ending June 30.	Ore smelted.	Metals contained in matte and bullion produced.			
		Gold.	Silver.	Lead.	Copper.
	Tons.	Ozs.	Ozs.	Lbs.	Lbs.
1906 (6 months only)	157,640	64,590	1,074,255	15,133,683	2,399,161
1907	222,573	69,168	1,100,271	20,283,083	3,443,310
1908	305,956	121,380	2,224,888	32,157,139	4,004,468
1909	347,417	114,920	2,443,475	43,675,077	4,637,631
1910	487,125	137,614	2,162,406	42,368,816	5,974,960
1911	388,785	119,067	1,458,788	24,026,015	4,421,988
1912	296,458	129,789	1,765,902	26,072,074	2,914,141
Production from 1894 to June, 1912	3,143,927	1,146,912	20,224,623	250,970,644	50,789,983

Granby Smelter.—The Granby Smelter is situated at Grand Forks in the Boundary district and is operated by the Granby Consolidated Mining, Smelting, and Power Co. The ores treated are those of the Company's mines at Phoenix, together with a small tonnage of custom ore.

The Phœnix ores are of particular interest because of the low tenor of their metal values, their self-fluxing character and the large tonnage treated. The recovery of metals during the year ending June 30, 1912, as stated in the Company's annual report, was: copper 1·25 per cent; silver 0·29 ounces, and gold 0·043 ounces.

The first furnace of 300 tons capacity was completed in 1900, and since that date the capacity of the plant has been increased from time to time until at present there are eight furnaces with a total capacity of about 4,500 tons per day. The converter plant was first installed in 1902, and enlarged in 1909.

The quantities of ores smelted and the total production of metals, shown in the next table, are as published in the annual report of the Company.

The smelter was shut down between August 11 and December 20, 1911, owing to the coal strike in the Crowsnest Pass District mines and the resultant coke shortage, which accounts for the falling off in production during the Company's year ending June 30, 1912. Throughout the calendar year 1912, however, the plant was continuously operated and a larger tonnage treated than in any previous year.

Ores Smelted and Metals Recovered at Granby Smelter.

Year ending June 30.	All material smelted.				Metals produced.		
	Granby ore	Foreign.		Total.	Gold.	Silver.	Copper.
		Ore.	Matte.				
	Tons.	Tons.	Tons.	Tons.	Ozs.	Ozs.	Lbs.
1901	169,087	7,832	.....	176,919	8,871	34,990	5,435,955
1902	293,645	4,454	3,001	301,100	20,786	274,511	10,836,851
1903	289,583	7,691	6,223	303,497	35,121	277,574	12,551,758
1904	516,059	36,182	4,290	556,531	54,493	275,935	16,020,986
1905	550,738	39,382	.....	590,120	42,980	215,449	14,224,692
1906	796,188	36,158	.....	832,346	50,020	316,947	19,939,004
1907	649,022	16,893	.....	665,915	32,738	201,337	16,410,576
1908	858,432	24,179	.....	882,611	40,068	300,264	21,092,288
1909	964,789	19,944	.....	984,733	45,760	335,520	21,501,528
1910	1,175,548	21,829	.....	1,197,377	48,752	356,746	22,754,899
1911	959,563	24,783	.....	984,346	41,707	343,178	17,858,860
1912	721,719	17,800	.....	739,519	33,932	225,305	13,231,121
1913	.....	.....	.....	.....	.....	.....	.....
Total	7,944,373	257,127	13,514	8,215,014	465,228	3,157,696	192,368,518

Greenwood Smelter.—The plant of the British Columbia Copper Company at Greenwood, B.C., includes three large furnaces, having a total daily capacity of from 2,400 to 2,500 tons.

The last annual report of the Company covers the fiscal period from December 1, 1911, to December 31, 1912. Frederick Keffer, Acting General Manager, reports that "The smelter ran steadily throughout the year, handling a larger tonnage than for any equal period in its history. During the first two and a half months, until a sufficient supply of coke was secured for the entire plant, only two furnaces were operated. The total tons smelted for the thirteen months of the fiscal year were 740,589, as compared with a total tonnage of 608,945 for the twelve months of the fiscal year of 1911. The sources of the ore smelted were:—

B. C. Copper Co.'s ores	443,022	tons.
Custom ores	284,575	"
Converter slags	12,992	"
Total	740,589	tons.

The coke consumed was 103,154 tons.

The converter slags included:—

B. C. Copper Co.'s ores	914	tons.
Custom ores	4,104	"
Clay	1,205	"
	6,223	tons.

There were produced 11,259,140 pounds of blister copper, containing:—

25,862·681 ounces of gold.
142 025·06 " " silver.
11,146 811 pounds of fine copper.

No material additions were made to the plant during the year, the machinery as a whole being maintained in its normal condition.

It is planned to use basic instead of acid linings for the converters should this be found practicable without material additions to the plant. Through decreased costs for clay, and elimination of labour in relining converters, it is probable that a decided reduction in the cost of converting can be effected."

The Ladysmith Smelter.—This smelter, owned by the Tyee Copper Company, was not operated during 1912.

Anyox Smelter.—At Anyox on Observatory inlet, Portland canal, the Granby Consolidated Mining, Smelting, and Power Co. is constructing a smelter to treat the ores from their Hidden Creek property. It is expected that this smelter will be ready for operation during 1913.